ENGINEERING INVENTIONS.

Messrs. John A. Lesourd and James Lotan, of Portland, Oregon, have patented an improvement in hydraulic elevators of the telescopic kind, in which a fluid under pressure, or which is supplied from a higher head or level than that to which it is necessary to raise the cage or platform of the elevator, is made to act upon a series of rams or tubes arranged to workone within the other. The invention, however, differs from other telescopic hydraulic elevators in its mode of action, valve gear, and mechanism, whereby are produced what the inventors term a "multiple hydraulic elevator." in which each telescoping section is controlled by independent valves, and may be raised or lowered independently of the other sections, thus making each section a complete elevating device within itself. and so that the working fluid may be introduced to either telescoping section to operate the platform of the elevator a given distance, or all of the telescopic sections may be simultaneously operated, as desired.

MECHANICAL INVENTIONS.

Mr. William Cowles, of Newburg, N. Y., has obtained a patent for an improved machine for rapidly and thoroughly cleansing and washing bottles, and rinsing them out before they are removed from the machine.

Messrs, Lewis Emery and Frank B. Stebbins, of Galion, Ohio, have patented a cutter head for producing raised panels from integral portions of the same with mouldings, and to round or bevel the edges of the panels to fit the grooves of the stiles of the door or other frame at the same time. This improvement claims to obviate all necessity for hand work.

A millstone dressing machine has been patented by Mr. Thomas C. Barnes, of Logansport, Ind. The invention relates to the dressing of millstones by means of a diamond cutter, and provides means for the adjustment of the cutter at any required angle, its feed at any proper speed, and its entire control in either direction by the operator. The entire arrangement may be made automatic at will.

Among the recent patents issued is one for an improved and simple steam whistle granted to Mr. J. E. Gause, of Brownsville, Tenn. In combination with the bell of a stearn whistle a movable valve is fit. ted for operation by the engineer, so that the tone of the whistle can be changed readily at the will of the engineer. Means are also provided for adjusting the bell to the steam outlet so as to obtain a clear tone.

Mr. Arthur Grundy, of New York city, is the natentee of an improved freight car which can be loaded very rapidly and easily with large and bulkymaterial. A section of the top of the car is readily remov ed to admit of the loading of hay, cotton, or any other material upon the platform, when the top can be restored to its place again without much trouble.

Mr. Louis Baumann, of Offenburg, Germany, has obtained a United States patent for a rag cutting machine by which a great saving in the power is claimed and a superior result is obtained. A reciprocating knife is connected to the frame by a pivoted link which gives an oscillating reciprocating movement to the knife, giving the latter a drawing ent.

A new universal joint has been patented by Mr. George Carlisle, of Attleboro, Mass., consisting of a U-shaped projection from a rigid collar on the end of each shaft, or spindle, connected by a link or ring, the U-shaped staples having each a projection in line with its shaft, beveled or coned to correspond to the angle at which the shafts are to be run in relation to each other. These projections serve to keep the ends of the shaft apart and prevent noise in operation.

Messrs. T. R. Ellerbeck and A. C. Young, of Salt Lake City, Utah, bave recontly secured letters patent for an improved hose and rope reel containing a spring which is coiled by the unwinding of the rope or hose, which spring winds up the hose or rope as soon as it is released. To prevent overwinding of this spring or unwinding it too far, a drum is arranged to travel on its axis and strike against checks, after making sufficient revolutions to tighten the spring as much as may be necessary.

Mr. George B. French, of New York city, has patented two methods of coloring the outside of finished cigars; one that of carrying the cigars on an endless apron under another apron containing coloring material, the arrangement of the apron being such that the tips as well as the body of the cigars are evenly colored. The other method colors the cigars by means of brushes, and a soft felt material in an annular channel outside a horizontal revolving plate.

An improved fire extinguisher has recently has contrived a board or block grooved to receive slid-ing blocks, each bearing a distinctive number, letter, or been patented, so constructed as not to be charged and put under pressure except at the moment that it is recharacter of a symbolic nature, the movements of superstructure; recapitulation of some principles in quired for use, and this can be accomplished in a few which by means of a single switch that guides into all induced electricity and magnetism; magneto-electrical seconds and without previous knowledge. This extinthe grooves, lateral and transverse, may be made to and dynamo electrical machines; motors, and the use guisher is filled with water in which has been dissolved form legible combinations. an alkaline powder. By a rod at the top of the extinguisher is held suspended a sealed bottle containing a preparation which will disengage carbonic acid. In dampers has been patented by Mr. J. M. Dolen, of Wi. lations to the electrical machines; the use of electricity Safe Deposit Vaults and Locks. See adv. p. 254. conisco, Pa. The object of this invention is to provide and its application to propulsion; the cars and their case it becomes necessary from fire to charge the apparatus, by turning a handle at the top of the extin- for closing dampers of stove pipes automatically when arrangement. In the growing interest felt in this new the heat becomes excessive. A friction device is provid_ branch of electrical science, this guide must prove de guisher the bottle will be dropped and its contents discharged into the alkaline solution; the gas being at same ed, so arranged as to hold the damper open, and made time disengaged and a pressure established. The in- fusible, so as to give way when the pipe becomes highly ventor of this device is Pierre C. E. Tabouet, of Paris, heated, permitting the damper to close by its own France. weight. A non-freezing hydrant is the subject of a AGRICULTURAL INVENTIONS. patent obtained by Messrs, William Vadersen and Mr. James A. Ehle, of St. Cloud, Wis., has | Frank L. Trader, of Elizabeth, N. J. 'The invention consists in a packed upper section of a street hydrant, invented an improved hay tedder. The invention consists inconnected mechanism by which the forks will and a valved lower section by which the water in the upper section may be allowed to run off to prevent be vibrated by the advance of the machine, and the forks will be made to pass forward over the hay when a freezing in severely cold weather, and by which, also, windrow is formed. 'The driver can readily dump the water can be readily drawn from the main or service gathered hay or can raise the rake to avoid an obstruc. pipe in any weather.

The amount of seed dropped, the spaces at which they should be dropped, and the intervals, if any, are entirely under the control of the driver of the machine,

Mr. Peter Rodenbour, of Quincy, Ill., has chimneys to sidings and partitions, invented a corn planter intended for planting corn or other easily deposited seed in hills, at equal distances apart, and adapted to any convenient or desired distances. The machine is adjustable to the amount of seed or the size of grains to be used, as well as to the distances

Mr. Elijah Hickman, of Red Bluff, Cal., has patented an improved grain heading machine, the cutter or sickle bar of which may be adjusted at will to cle, the trunks of the springs being attached to the thills the varying height of the heads of the grain, independent of the general movement of the machine over the surface of the ground. The improvement combines a means of forcing the heads of the grain against the sickle blade, and the center of gravity is brought nearer the center of the machine than in ordinary headers.

An improved panel fence has been recently: patented by Mr. James W. Rigg, of Mount Carmel Precinct, Ill., which has no permanent security to the istence of dampers or doors, by which the amount of ground but a pin used to secure a diagonal brace, but cold air and its circulation can be governed from the which may readily be withdrawn and redriven with very slight exertion. The panels are of light construction, can be easily handled, are self-interlocking, and their posts rest on surface blocks, so that the fence can be easily taken up, be reset, and moved from place to

Mr. W. C. Henderson, of Sulphur Springs, Texas, has patented a sulky plow constructed with the sliding block carrying the adjustable wheel locked in facilitate the distillation of the glycerine, which, withplace by a sliding spring-pressed bolt and withdrawn by means of an elbow lever. The sliding wheel carrying block is provided with rack teeth engaging with the teeth of a double gear wheel placed loosely upon the journal of the plow crank, and connected with the plow crank lever by a pawl, whereby the machine can be leveled and the plow adjusted by means of the same lever.

MISCELLANEOUS INVENTIONS.

Mr. H. S. Lockwood, of South Norwalk, Conn., has recently patented a very simple toy pistol, which he claims is perfectly safe and harmless, the explosion of the paper cap taking place in front of a plate or cut.

A convenient salt box for table use, with a sbaft having stirring arms or a screw propeller disk, from the stern, and attaching the hose to the rudder, for loosening the salt, has been patented by Mr. Robert, whereby the water issuing from the hose will assist in E. Caine, of Battle Creek, Mich. 'The same contrivance for keeping the contents of a salt box from caking may also be used for giuger, pepper, or other spice

Mr. John Zerr, of Keokuk, Iowa, has patented a fire escape in which scaling ladders are secured to the building, and belts are raised by means of ropes passing over pulleys at the upper ends of the uppermost ladders, by means of which the rope or belt or hasket can be secured for lowering persons.

Mr. Wiley D. Coffey, of Pangburn, Ark., has obtained a patent on a horseshoeing rest for hold. ing the feet of horses, mules, or other animals while undergoing the operation of shoeing, whereby the work is facilitated, the shoer relieved of supporting the weight of the animal's limb, and much danger to the blacksmith is avoided.

An electrical fire alarm for hotels and other buildings has recently been patented by Mr. F. A. Copeland, of La Crosse, Wis. A composition is used which melts at about 150 degrees Fahrenheit, and allows a weighted sleeve to swing around against a button on the wall, closing the circuit, and rings a bell in the office.

Mr. J. B. Jonis, of Olympia, Wash. Ter., has recently patented an improved toggle for boom chains which should recommend itself to lumbermen generally. It consists of a boom chain toggle formed of a metallic bar having a median eye projecting down from its under side, and fits into a hole in the boom stick, the bar being provided with right angle points which stick in the log.

Mr. C. W. Vetter, of Ukiah, Cal., has recently patented an improved fruit drier which consists of a stove provided with a heating chamber adapted to receive the fruit holding drawers, which consist of a frame holding a perforated metal plate, and provided with two hinged covers of perforated metal plates or wire netting, whereby fruits can be held between both surfaces of the perforated plate and the hinged covers.

A mechanical puzzle is the subject of a patent by Mr. William J. Decker, of New York city, who

a convenient and easily controlled mechanical planter. floorings with fine asiles or dry earth, or other noncombustible material -- in short, to make the present hollow walls and ceilings solid, or at least non-combustible, and to destroy the draughts that make inviting

> An improved two wheel vehicle, so arranged that the body of the vehicle will always maintain a level position without reference to the position or amount of the load, has been patented by Mr. Benjamin S. Porter, of Red Oak, Iowa. The invention also consists in the use of horizontally arranged Y-shaped springs, the upper and lower members of which are attached, respectively, to the body and axle of the vehior to a front cross bar of the vehicle.

Messrs. James Smith and David E. Blake, of St. Louis, Mo., have patented a plan for a refrigera-tor by which they claim to effect a great saving in the consumption of iceand insure a constant circulation of the air in the safe by its refrigeration after having taken up heat in the cooling of the contained provisions. A peculiarity in this refrigerator is the exoutside.

An apparatus for the manufacture of glycerine is the subject of a patent recently granted to $Mr. \label{eq:matrix}$ Otto Laist, of Cincinnati, O. The invention relates to the method of refining glycerine, whereby the glycerine is rendered inodorous and colorless. The improved process consists in the employment of a jet of superheated steam introduced into a glycerine retort or still to out the aid of the steam, condenses quickly from the volatile state. A previous patent of Mr. Laist covers a good many features embraced in the new patent; the latter covers, however, certain improvements in the distilling process not heretofore achieved.

An improved hydraulic motor for vessels has recently been patented by Mr. Simon O'Brien, of Bristol, R. I. The invention consists in a motor formed of a series of pipes and a cock so connected that water can be drawn in at the bottom of the vessel and forced out at the rear end of it, to the effect that the vessel will be moved forward. Water also can be drawn in at the rear end of the vessel and forced out at the bottom toward the front end, thus moving the vesselbackward. The invention also consists in attaching a hose or flexible pipe to the end of the pipe projecting steering the vessel.

NEW BOOKS AND PUBLICATIONS.

KING'S HANDBOOK OF BOSTON ; 360 pages profusely illustrated. Moses King, Cam-bridge, Mass., publisher.

To one who knew the Boston of twenty, thirty, forty years ago, this resume of his recollections will be pleasing, for the "hand book" is also a history, and recalls the events of the last fifty years. To those who desire to visit Iston this volume will be a convenient guide. It is very handsomely bound and is finely printed, and is of a convenient size for handling and carrying.

DIO LEWIS' MONTHLY.

The second number of Mr. Lewis' new magazine is before us,and its contents are varied and interesting. The editor has a wide reputation as a hygienic writer, and he is the author of a number of works on the health and treatment of young persons-bow best to promote their welfare and prolong their lives. The two numbers of Mr. Lewis' new magazine indicate that a large portion of its contents will be composed of articles on how to live, how to dress, how to exercise, and kindred subjects in which the public are thoroughly interested. The September number contains in the hygienic department, articles on ventilation, use of corsets, consumption and directions for building sun bath room and the benefits the consumptive and dyspepticmay derive therefrom. Frank Leaman, publisher, 68 and 69 Bible House, New York city.

DIE ELECTRISCHE EISENBAHN BEZUGLICH IHRES BAUES UND BETRIEBES. Von J. Kramer. Wien, Pesth, Leipzig: A. Hartleben's Verlag.

This small manual forms the 17th volume of the valuable series of electrical papers in Hartleben's library f electric technology, and supports the reputation already won by this useful publication. The chapters embrace the following topics: General remarks on railroad construction; determination of the factors employed in mapping; the foundation, the roadway, and Arm legible combinations. A simple and effective safety attachment for cal railway; steam engines, steam boilers, and their re-of improved Fire and Burglar-proof Safes, Bank and sirable and must meet with a profitable reception.

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Friction Clutch Pulleys. D. Frisbie & Co., Phila. Pa. Dies, Patterns, etc., Chas. A. Bailey, Middletown, Ct. Patent to let on royalty, or partner wanted to manufacture it. See cut page 248. Ed. Sauter, Hartford, Conn.

Pattern Letters (metallic) to put on patterns of cast-ings. H. W. Knight, Seneca Falls, N. Y.

Steam Pipe and Boiler Covering, Roofing Paints, Prepared Roofing, and general line of Asbestos materials. Phil Carey & Co., 127 Central Avenue, Cincinnati, O.

MASTERY.-An illustrated weekly devoted to Home Handicrafts, Household Affairs, Rural Occupations, Industrial Arts, Amateur Mechanics, Experimental Sci-ence; aiding young people in Self-culture of the Hand and Eye, and Self-help for Profit. Liberal offer to canvassers. Terms-\$3.00 per year, in advance; \$1.00 for 15 weeks, on trial; 7 cents a copy. Ask newsdealers, or address 842 Broadway, New York. MASTERY.

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If an invention has not been patented in the United States for more than one year, it may still be patented in Canada. Cost for Canadian patent, \$40. Various other foreign patents mayalso be obtained. For instructions address Munn & Co., SCIENTIFIC AMERICAN Patent Agency, 261 Broadway, New York

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Gear Wheels for Models (list free); Experimental Work, etc. D. Gilbert & Son, 212 Chester St., Phila., Pa. Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus, adv. p. 252.

tion.

A corn planter has recently been patented by Mr. Thomas A. Rasmuson, of Forest City, Iowa, the object of which is not only to facilitate the accurate planting of corn and other seeds in hills, but to produce

A method of making buildings fireproof. or non destructible, in all their parts, has been patented by Mr. William H. Dolman, of St. Helen, Oregon. He danger signals; distance signals; train signals; switch proposes to sheath all the ceilings of wooden buildings signals; control apparatus; brakes; unusual railway with sheet iron, and fill the interstices of stringers and electric systems.

DIE ELECTRISCHEN EINRICHTUNGEN DER EISENBAHN UND DAS SIGNALWESEN. Von L Kohlfurst, Wien, Pesth, Leipzig: A. Hartleben's Verlag.

This interesting and useful book forms the 12th volume of the above mentioned series, and is replete with information upon the intricate questions of railway signs, signals, and systems for prevention of accidents The subjects serially discussed are: Introduction of electricity in railway methods; principles of its appli-

cation; the carrier; sources of electricity; the transmitter and receiver; other apparatus; the electric telegraph; intermediate telegraph; telegraph connection from the railway train: railway signals : line signals:

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Drop Forgings. Billings & Spencer Co. See adv., p. 189 Woodwork'g Mach'y. Rollstone Mach. Co. Adv., p. 222.

C. B. Rogers & Co., Norwich, Conn., Wood Working Machinery of every kind. See adv., page 221.

Lightning Screw Plates, Labor-saving Tools, p. 220. Steam Pumps. See adv. Smith, Vaile & Co., p. 237.

Spy Glasses, Telescopes, Opera Glasses, Field Glasses Send for catalogue. Queen & Co., Pbiladelphia.



HINTS TO CORRESPONDENTS.

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

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 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 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 identiflcation.

(1) C. L. P. asks how to lacquer polished brassat home? If it can be heated on common oven, and about how hot? What to apply and how to apply it and how to prepare it? How bot the article should be, and howlong it should be left before using after lacquering A. The brass must be perfectly clean; it must be boiled in caustic lye if necessary. Many lacquers are med; half a pound of red lac dissolved in half a pint of a cohol is a good one. Put the article on the top of a stove jeweler's rouge, three-quarters of a pound precipitated until moderately heated and then varnish it, keeping it chalk. hot. Then dry it by heat.

(2) L. M. asks how to clean and polish cows' horns. A. Rasp the horn with a file to bring it to a smooth, even surface, then scrape with glass in the same manner as a shoemaker scrapes the soles of boots. This if carefully done will leave a fine, clean surface. Then rub with a piece of cloth and electro-silicon wet to a paste with water. Then polish with a cloth and oxide of tin wet with water to a paste. Sometimes the horn is rubbed down for a final polish with French polish instead of the oxide of tin. Whiting and chalk in water is also used.

(3) C. & Sons write: We are running a 5 horse power engine and using only about one-half horse power ordinarily. Would it be practicable to have an air compressor and reservoir, so as not to run our engine everyday? If so, please state the most economical kind of air compressing engine and reservoir. A. It is practicable, but we do not think it would "pay;" it would be more advantageous, if you make a change, to substitute a good caloric engine and sell your present engine and boiler, unless you have use for steam for other purposes than power.

(4) A. A. J. writes: If a tubular boiler be set with side walls kept clear away from the shell, say jacket space all round the boiler, allowing the heat to lem to make a tap match th rise from the furnace to the top, and the back end closed above the back arch, so that the draught will the shell? Is it better to close in at the sides as is usually done? A It is better and safer to close in at the sides say two or three inches below water line. (5) F. A. C. asks: 1. Would three eighths of an inch be thick enough for a 4x6 engine, that is, thickness of cylinder? A. Yes. 2. What size ports | A Steam finch by 3 inch, exhaust 34 inch by 3 inches. 3. Is there a patent on the double slide valve engine? valve engine 4x6 with 100 pounds of steam and 300 revolutions per minute? A. About 5 horse power.

to M. C. Bullock Mfg. Co., 80 to 88 Market St., Chicago, Ill.; in pipes and the resistance of the check valve, About ing on wire cable is not practicable. It has occurred if it is of any value, Mineral paints are not rare and are 240 feet.

> (7) W. J. W. writes: A locomotive with a six foot driver and a 22 inch cylinder, and a locomo-tive with same cylinder and "5 foot 8" driver—how much more space would the six foot driver cover than the "5 foot 8," both going at their full capacity? A. Assuming that the boiler was the same in both cases, and just sufficient, the 6 foot driver should cover a trifle more space; but if the boiler was of ample capacity, the space covered would be directly as the diameter of the wheels; this is supposing the same number of revolutions made in each case.

> (8) H. W. P. writes: I am using in my business a good deal of tea lead, which I buyfrom junk men; and my object in now writing to you, is to ask if you can give a good recipe for melting and separating the paper from the tea lead. A. To separate the tea lead from the paper, condense the mass of lead in an iron kettle. Put a layer of powdered charcoal over the and allow it to remain until the paper is carbonized and the lead is melted, then stir the mass with a dry stick and the lead will go to the bottom.

> (9) H. J. B. writes: I am desirous of obined for the same? Would the inspector that examines steamboat engineers be the proper one to apply to? amines steamboat engineers.

(10) W. D. P. asks: Does the size of wheel of a vehicle vary the amount of power required to start a vehicle? If so, please state how. A. It is generally conceded that the larger the wheels the easier the running for vehicles within certain limits as to weight and smoothuess of track. As a general practice, large wheels for rough roads are considered the best, as they give a longer tread or bearing.

(11) T. H. B. asks (1) if it were possible to run a train of cars through a vacuum, and to let drop a stone or feather from a window while the train was in motion, would the object reach the ground directly under the place where the window was when it was let fall. or would it be carried forward with equal velocity as train? A. The object would receive an impulse from the motion of the train which would carry it forward with velocity equal to the velocity of the train, while the action of gravity would give it simultaneously a downward motion. Therefore, when it reaches the ground, it will be directly under the window from which it was projected. 2. Is there any more or less water on the earth and in the surrounding atmosphere at the present time than there ever was? What is evaporation? Is it possible to totally destroy water? A. The quantity of water has not changed within a reasonable geological period. In the early geological ages there was more water in the atmosphere as clouds than now, and of course less upon the air or atmosphere. Water can be destroyed by converting it into its primary elements, hydrogen and oxygen.

(12) W. W. A. writes: Please give formula for a dry paste for cleaning gold, silver, and jewelry without scouring. A. Polish with whiting and ammonia. It is risky to use any silver soaps or cleaning pastes, as they may contain mercury, which injures the silver permanently. Try a quarter of a pound of

(13) J. J. B. asks how to put a surface on softsponge leather. A. Mastic varnish, rubber varnish, wax, size or glue, and calendering, or polishing with burnishers, are all used for smoothing soft leathers.

(14) S. H. B. asks: What is the difference between "quarter" and "bastard" sawed lumber? A. Bastard sawed lumber has the annual rings parallel with the surface in some part of the board or plank, and is the ordinary method of sawing. Quartering is sawing the log into 4 parts across the center, and then sawing the quarters so that the annual rings will run out to of tube or flue surface as above. For the actual horse C the surface. It is not economical for the lumber producer. Quartered lumber may be made from bastard by culling and sawing out the bastard centers

(15) W. O. S. writes: I wish to cut with a 20thread V tap, Brown and Sharp gauge, a cog wheel, lead and olive oil; now I want to know if cotton seed that shall have 100 cogs on the circumference. What must be the circumference of the wheel before cutting the cogs? A. The diameter of the pitch line should be 1591 inch diameter, to which add five one-hundredths inch for the outside or diameter of the blank. This will represent a proper wheel gear of 100 threads with a pitch of one-twentieth incb. As your tap will not commence cutting upon the pitch line, you will have to use the pitch line diameter for the diameter of the 6 inches, and arched over the top so as to leave a blank. Infact, it is a very difficult mechanical prohteath in Cutting a wheel (16) O. A. G. writes: Will you please inbe directed properly to the flues, will the heat above form me what acids or mixtures I should use to give the water line be too intense? Will it be injurious to copper a real or variegated appearance, such as is somecopper a red or variegated appearance, such as is sometimes seen on the ingots of the metal? I want it for ornamental purposes. A. The colors you see on copper ingots are due to oxidation of the metal by the air while the metal is hot. Try heating and evaporating drops of nitric acid on its surface and then heating. (17) L. W. C. asks: Can you tell me what should I have for a 4x6 engine with double slide valve?, preparation to use in covering the floor of a photographic dark room that will fill the cracks and render it water tight to prevent the slops from going through and A. No. 4. What will be the power of a double slide staining the ceiling below? A. Nail a narrow strip of wood around the corners of floor and put down a single sheet of oil cloth that exactly covers the floor. The strips are intended to bend up the edges of the oil cloth to prevent escape of liquid.

to me that I might lay a pipe, connect it with the boiler, and use compressed air. Would such a plan be feasible? Would the apparatus be reliable? Can compressors be purchased in market? What size pipe little or no value. Analysis of the three, \$1500 for would be needed? A. The use of compressed air would, we think, not prove economical or satisfactory. Cannot you bring the water to your place in a pipe and by it run a small turbine? If so, this will be the best arrangement.

(19) D. S. C. asks: What gives the lamp shades used on drop lights the light or white color? Are they glass or porcelain? If glass, what gives the glass the opaque or white color? Is it the peculiar kind of saud used? A. The lamp shades you refer to are of glass; glass is rendered opaque by various ingredients oxide of tin will produce this effect.

(20) T. J. asks: What is the process of making fine shot of lead and copper? A. By pouring the metal when melted through a strainer of perforated surface of the lead and cover the kettle as nearly air iron, allowing the metal to drop into water at a considtight as possible. Place the kettle over a strong fire erable height. Shot for ammunition is poured in shot towers and falls from 40 to 60 feet. The new way is to drive cold air up the shaft, which cools the shot with a short fall of 20 to 30 feet.

(21) H. E. B. writes, inquiring about the $|_{A}$ aining a license to run stationary engines. Can you economy of using a side wheel steamer as compared inform me to whom I must apply in order to be exam- with a screw propeller. I claim that the fastest time A that has ever been made on rough and smooth water has been made with a screw propeller, and it did not A. For your license apply to the inspector who ex- take any more coal to propel it than a side wheel steamer. The other party claimed that a side wheel steamer made the fastest time on smooth water and used less coal. A. For large boat of light draught, side wheel boats have made the best speed with greatest economy. For small steamers, yachts, etc., the screw has given the greatest speed, but with an enormous power and large consumption of fuel.

> (22) H. C. S. writes: Please let me know if B there is anything I can wash an iron mould with to belp make the iron come out smooth, as the mould is small and the iron chills before the mould fills up; or is there anything I can put in the iron to make it thinner, so the iron will run more freely? A. The iron used in casting the celebrated Berlin ware, consisting of ornaments, charms, chains, and other jewelry, is said to be alloyed with arsenic, but as arsenic is very volatile and dangerous to manage except by chemists, we do not recommend its use. Tin will make the iron more fluid. Use No. 1 iron in a crucible and add when B melted 2 to 5 per cent of tin. Use powdered charcoal to keep the iron from decarbonizing. Smoke the iron moulds and heat to about the temperature of melted lead. This may make the casting comparatively smooth. but will not prevent entirely the chilling of the iron. Casting in an iron mould has never been cousidered B very feasible except for chill purposes. Finer surfaces can be had from sand moulds.

(23) F. M. L. writes: Can the business of $\frac{1}{B}$ the earth. Evaporation is the absorption of water by carpentering, etc., be learned without a practical instructor? If so, what books are necessary for a beginner-the most comprehensive and practical? What will a set of drawing tools cost that are not fine, yet will answerall purposes? A. By studying "Appleton's Cyclopedia of Drawing " you will be able to learn architectural drawing without a teacher. Do not buy cheap drawing tools; better get along with a few and have them good.

> (24) C.G.H. writes: Can you kindly inform me of the formula for finding the horse power both nominal and actual of the ordinary locomotive and return flue : C boiler? In both cases hard wood is the fuel used, and there is a natural draught through a smoke stack 60 feet high. A. To obtain the nominal horse power of a locomotive boiler: Take the whole surface of the inside of the fire box and two-thirds of the internal surface of the tubes. in square feet, add them, and divide by 14,14 being considered the amount of effective surface equivalent to one horse power. The same also for cylindrical tubular and flue boilers with the fire under the shell and returning through the flues or tubes. The Ca whole surface of the under half of shell and two-thirds | Ca power: The quantity of water evaporated in dry steam per hour indicates one horse power per cubic foot.

> (25) E. H. A. writes: I read in one of the C scientific papers about an oil for lubricating made with C oil could not be used, and how long should it stand; and if it becomes too thick, what should be used to thin it? A. Cotton seed oil will answer. If it becomes too thick, thin it with kerosene oil.

(26) J. G. L. writes: 1. Would you please let me know how telephone wire is made, and what it is made of? A. Any iron or copper wire, or copper coated iron wire will answer for a telephone wire. The Cla standard conductor for telephones. 2. Is any wire of Cleaner. See Cotton cleaner. iron or steel with a thick coat of copper used for tele-. Clock and watch spring, G. P.

which is run by water. The location is such that shaft- maybe called silicious clay. W. W. -It is doubtful low priced .- H. W .- The clay is of very good quality and might be used as fire or potter's clay in the manufacture of common chinaware.-J. W. V.-Probably of iron only.-E. S. B.-The names of the specimens you sent are as follows: 7. Galenite and pyrite. 8. Pyrite. 9. Galenite. 10. Mispickel. 11. Pyrite.- W. L. B.-No. 1. Iron pyrites. No. 2, ditto in clay nodule. Probably oflittle value. - D. A. R. - The sample is infusorial earth, composed principally of silica. It is of little use except as a polishing powder or as fuller's earth.

INDEX OF INVENTIONS

For which Letters Patent of the United

States were Granted

October 9, 1883.

AND EACH BEARING THAT DATE.

See note at end of list about copies of these patents.]
ir and steam tran IT Kelly 996 446
ir trap for water engine, G. Murray, Jr
larm. See Fire alarm.
nimaltrap, C. F. Barrett
nvils, manufacture of, W. C. McCarthy
sphaltum, refining, E. J. De Smedt 286,396
uger bits, machine for forming, W. L. Parmelee 286,554
villig, J. L. Suith
ags, etc., for protecting jewelry, manufacture
of, O. Thowless
aling press, J. H. Badgley 286,168 at and ball combined W. L. Sweeten 986,570
at thus overflow connection, A. P. Creque 286,270
ed bottom, spring, A. Q. Allis 286,166
ell and fire alarm system, combined call, C. E.
ell. gong. H. W. Barnes
it brace, ratchet, W. R. Clarkson 286.888
ookbinding. W. I. Blackman
ottle washing machine, W. Cowles
ing box.
race. See Bit brace. Buggy top brace.
rake. See Car brake.
rush holder, paint. A. T. Edwards
uckle, W. R. Clough 286,264
uggy top brace, A. B. Davis
ullet and making the same, patched. H. F.
Clark
ung bush and stamp protector, combined, P.G.
Neisendorfer 286,474
urning fluids, reservoir for, A. L. Mack
ustle and hip pad, combined, C. M. Strong 286.562
utton pin, M. V. Quinn
abinet lock, F. W. Mix
able gearing, endless, W. B. Ross 286,228
alipers and dividers, W. H. Mitchell
andy machine, w. L. Yancey 286,557 ar brake, C. D. Whiting
ar coupling, Carter & Woods 286,175
ar coupling, G. W. Cross
ar coupling E Ingram 986 444
ar coupling. H. L. Johnstone
ar coupling, A. Lenhart
ar coupling, H. A. Palmer
ar deflector, railway passenger, A. W. Brinker-
hoff
ar door mechanism, street, F. B. Brownell 286,257 ar door, sliding, E. Y. Moore
ar. freight, A. Grundy
ar heating, ventilating, and draught-regulating
apparatus, railway, J. Spear 286,341 ar wheel W. B. Diron 286 183
ard holder, P. Ruffani
arriage, child's J. F. Downing 286,186
arriage top prop block, Thorpe & Pfaff 286,239
ase. See Musical instrument case. Piano case.
ash carrier, E. A. Thissell
elluloid, etc., machine for breaking or cutting
up sheets 01, J. Everuing 200,555
nains, toggle for boom, J. B. Jonis 286,544
hair. See Rocking chair.
neck for waive, w. H. Moseley 286.472 neck row wire reel. G. W. & F. P. Murphov 906.919
nuck, lathe, C. W. Gray
nuck, planer, J. P. Wright 286,362
urn, E. B. Way
flexible, A. D. Fox
der mill and press, combined, G. D. Cooper 286,265
gar coloring machine. G. B. French286,412. 286,413
amp and vise, U. L. Bellamy 286,376

B

C

Ce

Ci

(6) S. M. H. asks: Could a small boiler, say one horse power, be fed from a reservoir of sufficient elevation so that the hydraulic pressure from the reservoir would overbalance the steam pressure required from the boiler? If so, what height would the reser- horse power under 45 pounds pressure. I do not convoir have to be to insure 100 pounds steam pressure? sider it economical to use steam, and have been trying A. The hydraulic pressure must not only be equal to to secure power from a mill about twelve roots distant,

(18) E. D. C. writes: I have three presses run by a small engine which I consider good for four

phone for electricity, and how then is that thick cos put on? A. The copper coating you mention is deposit ed on the wire by the galvanic process.

(27) W. ($\frac{1}{2}$, A writes: 1. In the telephone described in the Scientific American Supplement No. 142. do the binding screws, a, project through th flange, E, and connect with the diaphragm in any way A. The binding posts are not connected with the dis phragm, but with the terminals of the bobbin. 2. How much wire should be wound around the spool, D? A No 3xed amount. Fill the spool with No. 36.

(23) T. McK. writes: Please give me th temperature of the water in a boiler when there is 2 lb. steam pressure; also give me the temperature of the water at 75 lb.? A. Twenty-five lb. pressure abov atmosphere, 2,665°; and 75 lb., 320°.

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

G. H. T .- It is principally silica. It might be o some value in the manufacture of fire clay articles. It

-	Clock and watch spring, G. P. Ganster	286,417
ıt	Clock escapement, G. P. Ganster	286,419
	Clock, secondary electric, A. S. Crane	286,181
-	Clocks by air currents, apparatus for winding, G.	
	P. Ganster	286,418
е	Clothes line support, M. Houman	286.441
г.	Clutch, friction, D. Mills	286,214
e	Clutch, friction, J. K. Proctor	286,556
	Cock grinding machine, W. E. Berens	286,525
÷.	Cocoanut sheller, J. P. Anderson	286,368
	Coffee, rice, etc., machine for hulling and polish-	
v	ing, H. B. Stevens	286,499
•	Coloring matter or dyestuff from thiodiphenyla-	
	mine, obtaining, A. Bernthsen	286,527
م	Coloring matter, sulphureted derivative of diphe-	
-	nylamine as a basis for the production of, A.	
9	Bernthsen	286,526
e	Cooler. See Milk cooler.	
e	Corpse lifter, J. M. Jacobsen	286,202
	Corset spring, M. F. Linquist	286,453
_	Cotton cleaner and condenser, W. H. Sawyer	286,224
	Counter stiffener machine, J. L. Hatch	286,432
1	Coupling. See Car coupling. Droplight pipe	
	coupling. Thill coupling.	
	Cup. See Oil cup.	
C	Curtain poles, ornamental shaft for the ends of,	
t.	Bassemir & Walker	286.521