ENGINEERING INVENTIONS

by Messrs. Henry Dods and Frank Hindes, of Virginia City, Nev. It has a compensating spring device to relieve the shocks of gripping the cable, and prevent the slipping of the grip on the cable; also a specially devised frame, bed plate, and slide, enabling the clutch to be so worked as not to injure the cable.

A car coupling has been patented by Mr. Timothy C. O'Donovan, of Walker's Mills, Pa. It consists in a combination with a drawhead having a flattened cross rod of a coupling link with a transverse groove, and an enlargement for receiving the cross rod of the drawhead, which link can be swung so that its hook can catch on the cross rod of the opposite drawhead, whereby the cars will be coupled.

A mine railroad has been patented by Mr. John G. Thompson, of Cuba, Ill. In an inclined or sloping road for working cars in opposite directions at the same time by a rope doubled around a drum at the upper end of the road, the road being single track with a turnout, the rope is so arranged within the single track, and branching into and along the turnouts. that the switches work automatically, and the cars cross the rope wi bout obstruction or delay.

An improved gauge cock has been patented by Mr. Michael J. Fitzgerald, of Fort Wingate, N. M. In combination with the stock and main and transverse passage, the plug has a weighted lever, and both leather and an interposed piece of cloth, the ends being of its passages are so made as to be entirely shnt of \mathbf{f} thus made more durable and less liable to stretch out from the passages of the stock in its closed position; the weighted levercan always be relied upon for keeping the cock closed except when purposely opened to test the water in the boiler.

MECHANICAL INVENTIONS.

'An insertible saw tooth of improved form has been patented by Mr. William B. Risdon, of Trenton, N. J. The tooth is made with a toe, a perforation, and a slit at its heel to adapt it to be secured in a saw plate with a shoulder and a recess at the rear end by a rivet wholly within the tooth, thus putting no strain upon the plate, and in no way affecting its truenes

A bolt header has been patented by Mr. Benjamin McKillen, of Verona Mills, Mich. It is a tool with handled and pivoted die jaws, having rabbet grooves in the lower side to be secured between and on the jaws of a vise. The tool affords great facility for making well defined angles to square shanks, and may also serve as a holder for rods of different kinds of work for setting and truing the parts.

An improved mechanical movement has been patented by Mr. Francis W. Goodyear, of Spring field, Mass. It is intended to make reciprocating mo tion more readily convertible into rotary, and is applied in a simple manner to various hand and foot power machines. There is a ratchet action in which no springs are used, and the whole movement is practically noiseless

An improved piano pedal stool has been patented by Mr. William Winter, of Albany, N.Y. The invention consists in a stool provided with foot levers connected by connecting rods and elbow levers pivoted on a bar of the stool and adapted to operate the pedal levers of a piano or like instrument. The stool is provided with devices foreasy and rapid attachment to the instrument or pedal lyre. The angle levers are provided with pads to protect the pedal levers from be ing in jured.

An apparatus for dyeing with hydrocar bons has been patented by Mr. Engen Rau, of Hartford, Conn. It is a dry dyeing machine with an appacolor dissolved in benzine and oil; it has a wringer for taking out snrplue color, and a drying chamber, from whence the fabric is conveyed between endless blank. ets through a highly heated finishing chamber where it is subjected to steam pressure, the whole in one continuous operation, and with no waste of color.

patented by Mr. Richard Thoens, of New Orleans, La. It is designed for the minute regulation of the flow of of different widths, so as to form a rough inner surface. gas, being especially intended for use in connection with ice machines in which ammonia gas is used. The valve stem is packed by rubber washers, between which is a metal washer, and these washers are clamped between metal rings with beveled surfaces, the rubber the rollers not to be in contact but as close as possible washers spreading to close tightly against the stem and without touching, and the grooved rollers being of the inner surface of the valve body.

An improvement in saw mills has been | shorten the time and lessen the labor of washing. patented by Mr. Walter P. Scofleld, of Hawthorn, Fla. It consists in a contrivance of belt shifting devices. whereby a trip block on the log carriage will automatically shift the belt from the loose to the tight pulley of the feed shaft, to rotate the latter only when the log pivoted and divided by partitions, one loaded side falls setting apparatus is to be operated; the driving shaft to discharge a weighed load, while the light side rises is supported steadily its whole length by pivoted bear- to be filled, the weigh bar being provided with a weight ings, and there is a locking device for the connecting which can be secured in any position to adjust the feed the paper, and so each quire will receive just the rods of the oppositely acting friction wheels of the set-ting apparent to hole the wheels out of context with wheels out of contact with to look the ig ap the set works drive wheel.

A cable grip apparatus has been patented arms of markers, and held up by springs, so that mark- flow into the channel plate, and the cover can be readiers are forced down to mark the soil by the revolution iy raised and lowered. of the drive wheels.

> The fender is constructed in combination with Ky. the plow beam, with its forward end pointed and curved sightly inward and its rear end curved outward and npward, so that as the plow is drawn forward the fender raises the leaves of the plants.

Mr. Obadiah Wilson, of Plainville, N. Y., has obtained a patent for an improved method of conveying tobacco from the field and depositing it in the drying house. The invention consists in a truck with four wheels and provided with a removable rack upon which the plants are placed after they have been cut. They are then transferred to the drying house and the and lower parts of the fifth wheel is greatly reduced, rack is removed bodily (rom the truck, which obviates the necessity of rehanding the plants, saving time and labor, and lessening injury to the crop from handling.

MISCELLANEOUS INVENTIONS.

An improved suspender end has been patented by Mr. Jacob Katzenberg, of New York city. It permitting the bees to escape, and there is no danger of is composed of colored braid with a lining of chamois of shape, while the braid is kept out of contact with the shirt of the wearer.

An improved fire escape bas been patented by Mr. John Schmittknecht, of New York city. It provides for a shaft let into the wall of a building, or goes into the water, and is so arranged that, when the placed against the same, the shaft having ladder rounds, and being provided at its upper end with a skylight, so protected with bars or grating as to prevent clandestine entrance.

A combined register and ventilator has been patented by Mr. William H. Maxfield, of Maysville, Ind. It consists in a special construction and combination of parts whereby the whole is made to present an ornamental appearance, great facility is afford. of the required shape of the roll of goods to be repreed for removing and cleaning the interior, and it may be readily operated from opposite ends of its air box.

An automatic vehicle brake bas been patented by Mr. Richard R. Pace, of Lineville, Ala. The invention consists in levers pivoted on thills held to the front axle by shackles, the levers carrying brake shoes at the outer ends, and having the outer ends connected with the thills by extensible braces. The brake can he so locked as to be made inoperative when desired.

An improved window cornice, that is convenient and readily adjustable, has been patented by Mr. Micbael Leuz, of New York city. The center piece has grooves and stop blocks, and there are sliding end pieces with end T-bars and set screws, the combination being such that the whole is strongly made and readily fitted to the place desired.

William A. Whitney, of Hudson, Mich., for an improved wheel barrow in which the legs and braces are. by a combination of bolts and metal devices, connected rigidly and closely to the handles, so that the wheel barrowframe will be very strong, and can easily be taken apart and put together again.

A vegetable grinder and slicker bas been patented by Mr. Edward Schmitz, of Winsted, Conn. A grating cylinder, which may be changed for a cutting cylinder, is devised so as to be suitably revolved in a sort of hopper, whereby the grinding, grating, or cutratus for saturating the previously dried fabric in a ting of cabbages, potatoes, and other vegetables may be readily accomplished, for domestic use or for feeding cattle

An improved hot blast stove for blast furnaces has been patented by Mr. Charles Alger, of Hudson, N. Y. The invention consists in the peculiar construction of the air heating pipes, which can be A gas valve for ice machines has been made of wrought iron if desired, and are faced inside and outside with firebricks, those inside being made fract, of Pittsburg, Pa. The heat is applied from di-

> A washing machine or improved washboard hasheen patented by Mr. A. E. Kiel, of Montrose, Iowa. The board has three roll sets, each set consisting of a ribbed, a smooth, and a corrugated roll, greater diameter than the plain ones, the whole to

> An improved grain weigher and measure has been patented by Mr. James E. Kemble, of Vicksburg, Mich. By a combination of valves in a circular case, inside of which is another circular case, suitably

has adjustable slides and arms to engage with crank lever, whereby the water received upon the cover will

An improved bottling device has been pa-A cotton, corn, and tobacco fender for tented by Mr. Alfred Rigny, of New York city. In a raising the leaves of plants while soil is being thrown tube open at both ends, the upper part carries a lateral around the stalks by the plow, has been patented by supply pipe, and there is a valve at the lower end, ope-Messrs, M. F. Duncan and R. E. Coyle, of May's Lick, trated by a rod through the tube. The tube is calcurated by a rod through the tube. The tube is calculated to occupy the exact space required to be left empty for corking the bottle, and it can be readily moved from one bottle to another without any waste of liquid.

> An improved fifth wheel for wagons has been Patented by Mr. Thomas Evans, of Gravesend, N. Y. It is formed of two circular channel plates with interlapping flanges and corresponding central depression and wearing surface, in combination with a circular skeleton frame with conical rollers journaled in its rims. By this means the friction between the upper and the turning of the wagon is made much easier.

A bee hive of new and improved construction has oeen patented by Mr. Edward Meyer, of Hallettsville, Texas. The bees can, in this hive, be fed and watered very conveniently, a peculiarly made water tank being attached; the honey can be removed without being injured by the bees while removing the combs, while the arrangement is such that none of the enemies of the hee can enter the hive.

A rotary leader link for fishing lines forms the subject of a patent which has been issued to Mr. Earl Ludwig Bollermann, of New York city. It is for hand lines, with a weight or sinker at the end which fisherman throws out his line, the snells with their hooks will not become tangled up with or wrapped about the line, but will fall in their proper places, no matter how much the line may be twisted.

Mr. Morris H. Marcus, of Edenburg, Pa., has patented an improved sample dummy. The invention consists in a dummy for cloth or rolled goods, made of wood or other suitable material, with its body sented, and having reduced ends, on which are secured and mounted pieces of selvage till a bulk is obtained equal tothat of the body of the dummy. This is covered a piece of the goods, thus representing a solid roll of cloth which is specially adapted for window show.

A folding cot of improved construction for use in hotels and hospitals has been patented by Emily F. Vance, of Gallipolis, Ohio. Two pairs of legs are united at the upper ends by longitudinal rails, the legs being crossed and pivoted in the usual way. A quilted bottom or sheet is lined and partly stuffed with cotton batting, and a pillow is provided at each end. which can be removed very easily and readily. The cot requires no mattress, and can be folded compactly.

A cap for receiving the fulminate for fireves in blassing rock, etc., has been natented Letters patent have been granted to Mr. by Mr. George Freund, of Durango, Colo. A metal tube is threaded internally and externally to within a short distance from the lower end, where a suitable fulminate is placed and the lower end closed by a cap. A threaded cap with a conducting wire is screwed on the upper end, or a fuse is then inserted. The tube can be screwed in a giant candle of explosive material. the flange fitting on the upper end of the candle.

A feed governor for cotton gins has been patented by Mr. Henry P. Schaefer, of Schulenberg, Tex. Most gin saws now suck or draw in the cotton fastest at the central part of the saw shaft, drawing the cotton from the edges of the feed board toward the center. By this improvement a thinner layer of cotton is fed at the center, the suction of the central saws drawing in from the thicker edges such portion as will make the whole supply to the gin saws even and regular and prevent all choking.

A new process of and apparatus for distillation has been patented by Mr. James G. Ponterect fire, steam jacket, or steam coil, and the fermented mash, beer, etc., are agitated during the distilling process in such manner as to prevent lees or solid particles from adhering to the side or bottom of the still and thus burning or scorching, this being accomplished by causing a stream of the liquid being distilled to be constantly withdrawn and forcibly injected back into the still while in operation.

A machine for wetting paper has been patented by Mr. John W. Morrison, of Omaha, Neb. The quires are fed to feed rollers. from whence they are taken by fingers so adjusted that only the under side of the paper may be wetted in a water tank, or the whole may be submerged, as desired, and thence the unper is conveyed out through other rolls to a receiving table, the whole being done as fast as the operator can the machine is set. An improved washing machine has been strip with a forked arm at each end, in the ends of the patented by Mr. E. W. Bush, of Armstrong, Mo. The prongs of which rollers are journaled, one being slight- object of the invention is to produce such a combination of parts as will facilitate the application of rubbing devices to an ordinary wash tub. There is a false bottom, below which the dirty water collects, and the false bottom being provided with radial ribs, the clothes to he washed are spread on the false bottom, and a disk is rccked to and fro over them in a horizontal plane by means of a suitable handle. The machine can be feadily adapted to or easily removed from any tub. A tobacco moistening tray has been patented by Mr. Charles N. Swift, of New York city. A shallow tray with perforated cover carries a sheet of bibulous by turning the edge of the cylinder over a wire, the material in such a way that a single supply of water whole making a measure simple in construction yet wilf last considerable time, and the tray requires but little attention, so being well adapted to place in show cases, etc., where the cigar boxesmav be arrangedupon

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mann, Le Doux & Maecker, sole agents, 134 Pearl St., N.Y. One 12 inch Weston Dynamo Electric Machine in good order, for sale at one-half price. Address P.O. Box 433, Hartford, Conn.

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Straight Line Engine Co., Syracuse, N. Y. Best in osign, meterials, working showing, governing; no packing. Curtis Pressure Regulator and Steam Trap. See p.349. C. B. Rogers & Co., Norwich, Conn., Wood Working

Machinery of every kind. See adv., page 350. LightningScrew Plates, Labor-saving Tools, p. 348.

AGRICULTURAL INVENTIONS.

A cultivator has been patented by Mr. Charles D. Reed, of Polo, Ill. According to this invention, as the standards and plows are moved laterally a bar keeps the couplings parallel, so that the shovels the blade upward, the whole to prevent the razor from will always be held at the desired angle with the line cutting the person using it. of draught, thus always doing good work, however they may be moved laterally.

A corn planting attachment for plows has been patented by Mr. Philip Dougherty, of Fort Dodge, Iowa. A jointed spout can be so adjusted to the depth of the intended furrow and the width of the furrow slice that the seed may be dropped in the outer part of the previous furrow and will be covered by the furrow the seed being dropped as the plow is drawn forward.

A corn planter bas been patented by Mr. and are so arranged and held in place that they will drop

A razor guard has been patented by Mr. James P. Tryner, of Denver, Colo. It is formed of a ly above and the other slightly below the cutting edge of the blade; one of the prongs has a check plate, and on the upper surface of the strip is a spring for pressing

An improved measure for measuring grain, vegetables, etc., has been patented by Mr. William A. Carpenter, of Bankers, Mich. In a metal cylinder having its top and bottom edges turned over wire rings, a wooden ring surrounds the upper part of the cylinder, and a wooden bottom rests upon a bottom flange made strong and durable.

A combined vault cover and ventilator has been patented by Mr. T. W. Langill, of New York city. it. The same inventor has also obtained a patent for a William P. Lanham, of Star, Mo. The seed dropping The casing has a grate at its upper end and a water moistening pad of some bibulous substance covered slides are operated by the revolution of the drive wheels, receiving channel plate at the lower end, the cover by a perforated plate, and supported on a plate rolded resting upon the inner flange of the channel plate, and at the edges over both the bibulous substance and the more or less seed as required. A pawl carrying wheel provided with a sliding rod, a connecting bar, and a perforated plate.

Woodwork'g Mach'y, Rollstone Mach. Co. Adv., p. 366 Steam Pumps. See adv. Smith, Vaile & Co., p. 382. AjaxMetal Company, Phila. Clamer's AjaxMetals for railroad, rolling mill, engine bearings, cocks, and valves. Fire Brick. Tile, and Clay Retorts, all shapes. Borgner & O'Brien, M'f'rs, 23d St., above Race, Phila., Pa Peck's Patent Drop Press. See adv. page 396. Drop Forgings, Billings & Spencer Co. See adv., p. 398. Bradley's Road Cart, Syracuse, N. Y. See p. 398. Diamond Planers. J. Dickinson, 64 Nassau St. N. Y. 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. Free, Address Emerson, Smith & Co., Beaver Falls, Pa. Hoisting Engines. Friction Clutch Pulleys, Cut-off Couplings, D. Frisbie & Co., Philadelphia, Pa. Gould & Eberhardt's Machinists' Tools. See adv., p. 396. Barrel, Keg, Hogshead, Stave Mach'y. See ad., p. 398. For Mill Macb'y & Mill Furnishing. see illus. ad v. p.396. Renshaw's Ratchet for Square and Taper Shank Drills. The Pratt & Whitney Co., Hartford, Conn.

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having a large number of notches in the quadrant for a locomotive reversing lever? Why would not nine or even seven do as well as fifteen, and the quantity of steam regulated by the through lever instead of altering the traverse of the valve? A. Of course working steam expansively, to the extent that the work required will permit, is more economical than "throttling," and the greater number of notches are used to adapt the expansion more accurately to the work.

(2) W. M. L. asks whether there is any difference in the effect on the health between the heat of a wrought and that of a cast iron furnace. A. We suppose there is no difference, if the temperature of the radiating surface is the same in both cases. But wrought iron heated by steam is better than cast iron at a red heat.

(3) W. W. writes: Am I likely to damage a steam boiler (8 horse) by painting it outside with coal tar? A. No; not injurious, but better heat it before use, to drive off the higher constituents.

(4) O. H. R. asks how to keep an engine boiler when the engine is not running. A. If the boiler is laid off for a length of time, after cleaning thoroughly fill entirely full of fresh water and close all opeuings; a little lime thrown into the water will be beueficial. Outside remove all the masonry where it touches the boiler, and paint as well as possible with fish oil.

(5) J. S. writes: 1. I have a lot of sewing machines to redecorate. I use a rubber stamp. Turpentine and all oily substances rot rubber. Could you give me the formula of a size to hold the gold leaf on said machines? They have been japanned and baked. A. A good gold size japan should not act injuriously upon a well vulcanized stamp. 2. Would it require a high temperature to do a good job of japanning? A. Yes. 3. Are there different grades of japan which should require different degrees of heat ? Yes. The heat varies with the different grades and makes. 4. What kind of thermometer must I ask for? It must rate over 300 degrees. A. A good thermometer of Fahrenheit's scale. from 32 degrees to 400 degrees, with metal back and well guarded to prevent breaking by the heat. 5. Could you send me theaddress of an importer of French metal? A. We are not familiar with the term French metal. What is it used for?

(6) F. M. F. asks: 1. Of what is Professor Crookes' radiometer made? A. It consists of a fly or vane having four aluminum arms, to the extremities of which are fixed thin disks of mica blackened upon one side. This fly is poised upon a very fine needle point,

makes practically no difference. 5. I understand that wax. Perfume with nitro benzol. Apply in small the resistance of a telegraph instrument must equal the quantities, wipe with a cloth, and brush. resistance of the line and battery. When two are used, should the resistance be divided? A. The circuit produced by the telephone is of great intensity, and capastruments may be used in the telephone circuit. 7. Where can I get directions, working draughts, etc., for Catalogues free.—Scientific Books, 160 pages; Electri- making a galvanometer? A. In Frick's "Physical cal Books, 14 pages. E. & F. N. Spon, 35 Murray St., N. Y. Technics," Ganot's "Physics," or any of the moderu elementary works on electricity. You will also find much information on the subject in the SCIENTIFIC AMERICAN SUPPLEMENT. 8. How shall I prepare a carbon plate, in order to solder a metallic connector to it? A. Copper them. This you can readily do in any of the forms of sulphate of copper battery. 9. Wouldvulcan-ite be as good as wood for the tube in the center of the induction coil described in SUPPLEMENT, No. 1609 A. Probably better. 10. If this coil were excited by the dvnamo described in SUPPLEMENT, No. 161, and connected with a 5-strand barb wire fence 600 feet long, would an unpleasant shock be given any one touching the fence in dry weather? A. If the wires were well in. sulated, yes. 11. Suppose the dynamo described in and of double width and thickness, would the proportions be correct? A. Yes. 12. If double magnets were used as in Weston's machine, would the armature have to be enlarged, and, if so, how much? A. If you desire to make a large machine, you would do well to examine the Weston, Edison, or Siemens machine. Therarmature of these machines are different from that described in the SUPPLEMENT referred to, and are necessarily somewhat larger. 13. What number wire should I wind the magnets and armature with for incandescent lighting, and how many lamps would it light? A. For a machine twice the size of that in SUPPLEMENT, No. 161, wind the armature with No. 16 wire and the magnets with No.12. It would probably run two or three Edison lamps. 14. Can I get any better design than this for a dynamo, one sufficient for 15 incandescent lights, and if so, please let me know where to procure it? A. See answer to No. 12. 15. What size ports should a 2% x 31/2 inch engine have, 60 pounds pressure, 200 revolutions per minute? A. Supply ports $\frac{3}{16} \times \frac{1}{2}$ inches; exhaust 57, x 11/2 inches. 16. At what fraction of best results? A. Two-thirds, 17. A gasometer rises and falls irregularly, with a 40 foot stroke — how (1) W. M. asks: Is there any advantage in can its altitude be recorded in an office 6,000 feet wing a large number of notches in the quadrant for a away? Is there anything in the market for this purpose? A. There is no easy way of doing this. The distance is so great that no mechanical device, unless very well made, and strong, would be accurate. An electrical device something on the burglar alarm principle might be

used, contact pieces being placed at intervals on the side of the gasometer. (9) Perham writes: We have occasion to mark a great number of cotton flour sacks for shipment. Pencil and colored chalk obliterate too freely before teaching destination. Can you recommend something to use for this purpose, and where can it be obtained? A. Try the following: Melt together six parts of tallow soap and six parts of beeswax; when thoroughly melted and mixed add one part of lamp black or Prussian blue;

Run into moulds to form crayons of suitable size. (10) S. T. writes: In SUPPLEMENT, No. 407, page 6,495-the Electric Furnace-how is the electric arc applied to the various crucibles to be effective? A. One of the electrodes is made in the form of a crucible. (11) P. W. asks: 1. I would like to know what is the best metal to use for insulating electric wire, and how applied? A. Metals are not insulators; gutta-percha, Iudia rubber, and various gums are insulators. 2. What has the size of wire to do with the conductive power, and what metal is best? A. The resistance of a wire is inversely in proportion to its sectional area. Silver is the best conductor. Copper is next. 3. Is lead non-conductor or partial? Lead is a poor conductor. 4. Does the atmosphere absorb any of the electric current passing over wires (in all kinds of weather)? A. Yes. 5. If so, would a perfect insulator prevent it? A perfect insulator would prevent it, but such a thing is not known.

(12) C. R. asks for a good formula for porcelain collodion for transparencies? A. The following from Dr. Vogel's book will probably suit you;

A .	Pyroxylin	1 gramme.
	Ether	
	Transparent alcohol.	
Left	to settle.	
В.	Magnesium c'hloride.	1 gramme.

Alcohol...... 10 c. c. To be filtered.

C. Silver uitrate, 20 grammes, dissolved in water, 30 c. c., to which is added alcohol. 70 c. c. To be filtered.

D. Citric acid, powdered, 18 grammes, dissolved in Superior ink. Inferior ink. ing water, 18 c. c., to which is added alcohol, 162 of galls Carpets, name plate for marking, J. H. Vande-c. c. To be filtered. Carriage curtain fastener. W. E. Curtis...... 290,991 Six hundred cubic centimeters of solution A are pour Carriage topjoint, W. H. Thompson..... Carriages, canopy holder for children's, G. D. (26) R. S. writes: I am building an engine ed into a bottle of vellow glass: 50 c. c. of B are added
 Paul.
 290,103

 Cartridge implement, E. R. Darling (r).
 10,421
and well shaken; next 60 c c. of C are poured in and 3x3 for a 20 foot steam launch. I intend using an upshaken for five minutes; finally 40 c. c. of solution D right tubular boiler, and want to use oil as fuel if pos-Cartridge implement. Smith & Hansberry...... 290,127 are added, and the whole is left eight to ten days, when gible. Please let me know what size boiler I require, Case. See Eyeglass and spectacle case. it will be fit for use. and also the amount of square feet of heating surface, Cash and parcel carrying system, M. Clark 290.175 (13) E. H. S. asks for a receipt for a varto runmy engine at 500 revolutions a minute. Is burn-Cash car, E. P. Osgood. 290,130 Chain, ornmental, C. H. Ware. 289,874 nish for boots. There is no waterproof varnish that I ing oil practical? And if so, how should lamp be ar-Check rower, D- W. Jacoby.... 289.913 know of that does not injure the leather. ranged? A. We think you should have a boiler with not less than 50 to 60 feetfire surface, for burning oil. Α. 2. Burning oil has been practiced successfully in the Spermaceti 6 'Oil Region" and on locomotives. 3. The arrange-Coal tubs, lock for self-dumping, G. L. Stuebner.. 289,940 ments are varied, but generally the oil is cent into the Asphalt varnish 5 Powdered borax..... 1 " furnace by a current of steam through an injector, the oil and steam mixing as they pass into the furnace. Coffin ornament, J. B. Sargent 280,118 Steam must be first got up in the usual way. Nitro benzol 1 ' (27) A. D. B. asks: 1. What size boat will the 41% horse power engine made by James Leffel &

Magic Lanterns and Stereopticons of all kinds and with the length of the line? A. Within certain limits it | the color, previously rubbed smooth with a little of the

(14) J. W. H. asks: 1. How is nitrate of antimony made? A. According to Ad. Wurtz, the neutral antimony nitrate is not known, but a basic nitrate ble of operating through great resistance. 6. How is it is obtained by dissolving the antimony protoxide in with three or more instruments? A. Three or more in- fuming nitric acid. 2. How is the potassium bichromate solution prepared that is used in the two fluid cells, i. c., bichromate solution in the glass jar with the carbon and dilute sulphuric acid in the porous cup with the zinc? A. Potassium bichromate, 2 parts, dissolved in water, 20 parts, to which is added sulphuric acid, 1 part. 3. Pleasegive me the composition of the cell used in medical batteries? A. Mercuric chloride.

(15) L. S. asks how to prevent steel springs from rusting. Whatever is applied mustnot crack in bending. A. You do not mention the kind of spring. Oiling might answer in some cases. A thin coat of fine japan baked on would prevent rust. The springs might be coppered.

(16) S. S. asks for the most economical method for using a hydraulic pressure pump to produce the required pressure for a washstand? A. The best method to produce the effect of a city water works is to SUPPLEMENT, No. 161, should be made twice as high, Dul a tank in the attic and use the pump for keeping up supply. If your building is low, so that an elevated tank is not available, you may have an air tight tank upon the same floor and use a force pump for putting water into the tank and an air pumpfor keeping up the pressure. A pump could be constructed for pumping both air and water.

(17) F. X. A. asks for a good, cheap way to manufacture emery paper. A. In large manufactur ing establishments emery paper is made by feeding the paper into a machine, where the glue is rolled upon the paper, and the emery is distributed automatically. The old way is to brush the glue on by hand, then hold the sheet over the emery box and pour the emery over the paper with a shallow pan. The paper must be previously moistened so as not to curl.

(18) O. G. asks whether the beet sugar industry is carried on to any extent in this country, or, if not, whether any experiments have been made in this direction. A. There have been many trials to make beet sugar in this country. They have not been successful. The beets seem to lack the sweetness or sugar princi-ple necessary to satisfy the requirements of the American market. Experiments have been made in Illinois, Wisconsin, and California. which proved unprofitable, also in Delaware and Maine. Address the Commissioner of Agriculture, Washington, D. C., for reports upon the beet sugar interest in the United States.

(19) C. H. M. asks how large and where the largest engine is in this country. A. We believe in the steamer Pilgrim-110 inches diameter of cylinder and 14 feet stroke.

(20) H. A.-Use eight or ten cells of plunging bichromate battery for rnnning a small incandescent electric light. Use twenty or more cells for the arc light

(21) G. A. L.-At the close of 1882 there were in the United States 15,551 passenger cars, 5,366 baggage, mail, and express cars, 710,451 freight cars of all classes

(22) J. P. B. asks: What would best dissolve thin paint skins, so as to make them suitable to apply to leaky roofs or around chimneys? A. Dissolve half a pound sal soda in 1 gallon rain.water,cover the paint skins with this solution, and then soak them for a couple of days in the mixture. Finally heat them, adding oil to reduce the mixture to a proper consistency for painting, and strain. Benzine may also be used to dissolve the skins.

(33) W. L.T. writes: In Scientific Ameri-CAN. October 27, 1883, is an article in regard to catechu for dissolving boiler incrustation. I wish to knowhow much catechu to put in a ten horse power traction engine; how to get it in the boiler, and how often would you advise one to use it. A. Dissolve in water and send it through feed pump. The whole process is described in article referred to. 2. Also what is good to keep a boiler from foaming? A. We cannot give you a remedy for foaming till we know the causes; foaming has various causes. 3. How do they tell the horse power of an engine, say an 8 inch bore, 12 inch stroke, 200 revolutions per minute? A. Refer to rule in SCIEN-TIFIC AMERICAN SUPPLEMENT, No. 253.

(24) H. C. A. -- Use ordinary copal varnish. or picture varnish. See answer to query No. 7, SCIEN-TIFIC AMERICAN for July 7, 1883.

(25) J. V. R. asks: What proportion of gallic acid and sulphate of iron to a quart of water would constitute a good writing fluid? A. The proportion of iron sulphate is generally about one-third that of the galls, and the solid ingredients about one-fourth that of the water. Thus:

about 34 inches or 36 inches diameter and 3 feet pitch. 3. How many pounds would the boat carry, and at what rate of speed? A. With engine making 250 revolutions per minute, should make about 814 or 9 miles per hour in still water, and carry 21/4 to 3 tons according to model and weight of boat.

(28) H: D. asks how many Bunsen cells (two quarts each) will be required to run an incandescent electric light. A. 40.

(29) J. A. K.-First telephone was invented and made by Phillipp Reis, in 1860.

(30) J. L. writes: Could you furnish me ith a receipt for making a good sticking gum, similar to that used for envelopes of letters? A. Use the following:

Dextrine	2 0	unces.	
Acetic acid	1		
Water,	5	. 4	
Alcohol	1		
Add the alcohol to the other ingredie dextrine is completely dissolved.	nts	when	the

INDEX OF INVENTIONS

For which Letters Patent of the United

States were Granted

December 11, 1883.

AND EACH BEARING THAT DATE.

ſ	Seenoteat end	of list	about co	nies of the	se natents.]

	[Seenoteat end of list about copies of these pate	ents.]
ļ	Abrading machine, F. W. Coy	100 006
	Acid from native borate of lime, process and ap-	
÷	paratus for obtaining boracic, J. B. Hobson Advertising letter paper and envelope, F. P.	289,836
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÷	Animal trap. F. Glasson	
ļ	Animal trap, J. A. f. Marty	
i	Axle box, car, F. J. Roberts	
l	Bars, etc., apparatus for compressing. surfacing,	
l	and simple his mine 1 f Tamia	900 0777
ļ	Basin and water closet valve, H. Smith	259,927
ł	Battery. See Galvanic battery.	000.017
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	Bee hive, A. Fraley	
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	Bell fastening, J. B. Norton	
	Belting, J. K. Tullis	290,147
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	Blast furnaces, apparatus for charging, F. W.	
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:	Boiler. See Sectional safety boiler. Steam boiler.	
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	Bolt header, B. McKillen Book support, A. Bell	
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ł	Bottle stopper, G. S. Prior Bottle stopper, cap, and label combined, W. B.	290,192
	Dean	289.814
i	Box. See Paper box. Sanding box.	
İ	Box, H. A. & A. A. Smith	
	Box nailing machine. J. H. Swift	
i	Bran, etc., device for packing, J. Elder Brake. See Car brake. Electro magnetic brake.	290,013
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	low	
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'	Car coupling, D. P. Kahl	290.060
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	Car coupling, Odell & Cordell Car safety bridge, railway, A. B. Smith	
	Cars on curves, moving street, N. A. Fisher	
	Carpets, name plate for marking, J. H. Vande-	

. 290,144

.. 290,148

and inclosed in an exhausted glass build. 2. In what SUPPLEMENT are directions given for making a dynamo electric machine? A. In SUPPLEMENT No. 161. 3. About how much would it cost, how much power would be required to run it, and how many arc lights would it run? A. It would cost about \$35, would require 1/4 horse power, and it might run one very small arc lamp.

(7) A. G. A. writes: 1. I have made a small induction coil. Will you please tell me through your valuable paper how to make a magnet for the coil by which I can regulate the shock? A. Bind the bundle of wirestogether with fine iron wire, or inclose it in a thin sheet iron cylinder, and vary the strength of the current by changing the depth to which the bundle is inserted in the coil. 2. Will a solid iron bar do in place of a bundle of iron wires? A. It will not be so efficient as the bund le of wires.

(8) F. T. H. asks: 1. Would it be lawful to make and use a telephone exactly like the one described in SUPPLEMENT, No. 142? 2. Would it be lawful to sell such a telephone? A, 1 and 2. See advertisement

Melt the wax, add powdered borax, and stir till a kind Co. drive up a river? A. Boat 24 feet keel by 6 feet relating to telephones in another column of this paper. of jelly has formed. In another pan melt the sperma-3. Will this telephone, work 1½ miles? A. Yes. 4. Has ceti, add the asphalt varnish, previously mixed with oil beam by 3 feet 6 inches hold. 2. What would be the