

## RECENTLY PATENTED INVENTIONS.

## Engineering.

**CUT-OFF GOVERNOR.**—George M. Hull, Kearney, Neb. This is a device more especially adapted for use in connection with rotary or other high speed engines. Upon a rotary shaft is a fixed cam, and a rotary cam held for limited reverse or lag motion as the shaft rotates, to close over the cam recesses in the fixed cam. A valve-operating crank arm engaging both of the cams. The arrangement is such that the movement of the cut-off valve in the steam chest varies in exact proportion to the speed of the rotation of the shaft, forming a variable cut-off governor of very simple construction, but which is effective and positive in its operation.

## Railway Appliances.

**CAR COUPLING.**—Valentine Erbach, Scranton, Pa. According to this improvement the coupling hook, pivoted in the drawhead, has a shank and twin heads, arranged one at the rear of the other, the inner face of the outer head being concaved and the corresponding face of the inner head convexed. The construction is such that when coupled with the link or hook of an opposing drawhead, no matter how decided the curve, the hooks or links of the couplers will have two bearings, and ample play will be provided for the drawheads and links, both vertically and laterally. The coupling is inexpensive and the hooks are so strong that there is but little danger of their becoming injured.

A further patent by the same inventor provides a drawbar attachment between the drawhead and the body of the car admitting of the drawhead being carried laterally to any desired angle. The attachment may be readily applied to a drawhead of any description, and the invention further comprises the employment of a spring to compensate for any sudden jerks incident to the sudden stopping and starting of cars, the construction being very simple, durable, and inexpensive.

**CAR COUPLING.**—Charles B. and Thales D. Stewart, Walla Walla, Washington. These inventors have devised an improvement in couplers of the link and vertical pin type, adapted to effect the automatic coupling of cars by their impact as the drawheads come together, the uncoupling being effected from either the side or the roof of the car. In a chambered drawhead is a guide box adapted to be opened at the front, a spring-pressed perforated diaphragm plate sliding longitudinally between the guide box and drawhead, while a coupling pin working in the guide box is adapted to pass through the holes in the diaphragm plate and drawhead when the perforations are aligned.

**CAR DOOR.**—Ferdinand E. Canda, New York City. This is a door more especially designed for refrigerator cars, to effectually render the car air tight or permit ventilation whenever desired. The door frame is secured to the inner surface of the car side, and a door closes the opening in the frame, while an inner auxiliary door is fitted to slide on the inner surface of the door frame. The door is absolutely air tight, is adjustable to any ordinary irregularity, and is not affected by any sagging of the car body.

## Mechanical.

**KNITTING MACHINE.**—Carl B. Sander, Chemnitz, Germany. This machine has a revoluble pattern thread and band carrier journaled in a sliding bearing, with means for imparting intermittent rotary motions, and in opposite directions, to the carrier. The machine is of simple and durable construction, and is arranged to wind a band, braid, cord, etc., around some of the pattern threads.

**SEWING MACHINE PRESSER FOOT MECHANISM.**—Henry A. Dodge, Boston, Mass., Walter G. Tillou, New Haven, Conn., and William T. Richards, Newton, Mass. This improvement relates especially to leather sewing machines, and comprises such construction of the presser foot and its connection with the presser bar that the foot will be capable of three adjustments—a vertical, a horizontal upon a plane, and a rotary in a horizontal direction, the latter being a fine adjustment. The arrangement is such that the presser foot and the setting points of its under surface can be quickly adjusted to the center line of stitching, the adjustment being further advantageously brought into action should the stitching be irregular, and with irregularities in the surface of the material.

**MECHANICAL MOVEMENT.**—Isaac S. Bryant, La Junta, Col. This inventor provides a movement of simple and durable construction, more especially designed for use on engines and other motors, to convert reciprocating into rotary motion, avoiding all dead center positions of the transmitting parts. It consists of a reciprocating crosshead on which are mounted sprocket wheels engaging the upper and lower strands of a sprocket chain, the wheels being adapted to be locked in position by pawl and ratchet mechanisms.

**NAIL SET.**—Charles F. Markley, Hopkins, Mo. This is a simple and cheap device, which can be carried in the hand or the nail pocket, there being in its body portion a central aperture through which a finger may be passed to hold the set out of the way when not in use, while at either end are extensions forming punches or set members proper. The set members are of different sizes and adapted to operate on large or small finished nails or brads.

**STAPLE FORCEPS.**—Stephen L. Griffith, Chardon, Ohio. This is a device in which opposing jaws are independently pivoted on a handle to which is also fulcrumed a lever adapted to engage each of the jaws in the rear of its pivot. The device is very strong and simple, and enables the user to quickly and conveniently remove staples from posts or other places.

**NUT WRENCH.**—Fred A. Carrithers, Pekin, Ill. In this tool a fixed jaw and handle are connected to a shank, and a ratchet bar is held against displacement in relation to the handle, while a movable jaw slides on the shank and on the ratchet bar, a screw mechanism moving the handle with the ratchet bar longitudinally of the shank. The tool is especially adapted for a pipe wrench, having means to clamp an elbow efficiently, and it may also be used as an ordinary monkey wrench.

**SELF LOCKING NUT.**—Walter E. Bunker, Natick, Mass. This nut has an integral cup-like base, united at its crown directly to the nut proper, such cup-like portion having in its outer bearing edge upwardly extending slits, whereby the crown of the cup will operate as a brace and support for each of the spring sections formed by slitting the edge of the cup. A considerable frictional contact is thus obtained when the nut is applied, to prevent any accidental reverse movement of the nut.

## Electrical.

**CARTRIDGE SHELL BATTERY.**—James J. Pearson, Brooklyn, N. Y. This is a compact, powerful and inexpensive sealed battery, whose outer casing consists of an ordinary cartridge shell, with a cylindrical lining of zinc or other electro-positive material, a cylinder of silver chloride forming the negative element supported by elastic insulating disks. An electrolytic body is interposed between the chloride of silver cylinder and the zinc lining, a hermetic seal closing the open end of the shell, and a silver wire extends through the seal and passes in a zigzag direction through the silver chloride cylinder, the open end of the shell being contracted or grooved to retain the contents.

**WARPING MACHINE STOP MOTION.**—Clayton Denn, John Cocker, and Charles Denn, Philadelphia, Pa. This is an improvement in stop motions where an electric circuit is closed by the breaking of a yarn or thread, the current then operating mechanism to stop the machine and prevent the manufacture of imperfect goods. The improvement relates more particularly to the sliding guides supported by the yarns, and which operate as circuit closers, the slides being so arranged that when dropped by the yarns they will make a sliding contact with adjacent terminals, there being always sufficient surface engaged to insure the closing of the circuit, while the parts are not liable to oxidize to such an extent as to interfere with the closing.

**LETTER ELEVATOR.**—Bernard Waldstein, New York City. This invention relates to means for elevating letters, parcels, etc., from the ground floor of an office building or dwelling to the upper compartments, the elevating device being set in operation from the upper floors to automatically elevate or lower the parcel carriage. An electric motor, operated in the usual manner, is employed to elevate and lower the carriage, and one of the circuit wires is run adjacent to the upper or discharge end of the chute, the connection being such that by moving a switch the occupant of a particular compartment may raise and lower the carrier.

## Agricultural.

**CORN HARVESTER.**—George H. Schauk, Libertyville, Ill. This machine has a vertically adjustable caster wheel support at its front end, and the rear axle has crank portions, and hinged to the rear end of the main or cutter frame is a tilting shock-forming platform having ways for supporting the lower ends of the stalks as they are slid off. The machine cuts standing corn and delivers it onto the platform, binds it into a shock, and slides it off to the ground. The main frame and platform can be raised and lowered to cut the stalk at the point desired, and the machine is of simple and inexpensive construction and easily run.

**MOWING MACHINE.**—Benjamin J. Sykes, Sykesville, Pa. This invention relates particularly to endless knife machines, and provides improvements therein whereby the cutting apparatus will normally be held down upon the ground, but allowed to rise when an obstruction is encountered, and immediately thrown down again when the obstruction has been passed. The construction is such as to relieve all parts of undue strain, the endless knife is safely guided and protected from grass at all times, and the driving gear attached to inner end of finger bar is also protected. The finger bar is operated by a foot lever, leaving both hands free for the management of the team.

**MILK CAN.**—Charles E. Hinman, Oxford, Neb. This is an improvement upon a formerly patented can in which a tapering plug is forced into the can to compress the milk globules and prevent agitation of the milk when the can is shipped. The plug, according to this improvement, extends downward through the can, and is a hollow central plug of such capacity that ice may be packed in it to keep the milk cool, means being provided for catching the overflow when the plug is inserted, and for firmly fastening the plug, sealing the can, and bracing it so that its bottom will not bulge.

**DRAUGHT EQUALIZER.**—Samuel I. Larbins, Murray, Ia. A span bar at one side of the tongue, according to this invention, carries a double tree, and an equalizing bar attached over the span bar extends across the tongue, with a double tree attached to its free end, the single trees of which are on opposite sides of the tongue. The evener at one side of the tongue is pivotally connected with the vehicle or machine to be drawn, the device being especially designed for use with reapers and harvesters. It will perfectly equalize the draught of a four-horse team, three of the horses being on one side of the pole, and thus carry forward, with even draught, any character of load.

## Miscellaneous.

**BRICK KILN.**—Carriell Forrester and Augustus H. Donecken, Omaha, Neb. This is a continuously operating kiln in which interchangeable parts are employed in connection with a central permanent part, and arranged in such a manner that, as one section of the kiln has been burned and cooled, and the bricks are removed, such parts can be moved forward to form a new or green section while the intermediate sections are firing. Permanent and detachable flues are so arranged and provided with dampers that the draught can be regulated right and left through the bricks at will, giving an even distribution of heat all over.

**FREIGHT TRANSFERRING DEVICE.**—Oliver Spitzer, Brooklyn, N. Y. A cable running in an underground track has a projection adapted to engage and move a wheeled truck, the latter moving a hand truck or other vehicle carrying the load. Provision is made for guiding the cable around curves, etc., and the

construction is simple and durable, being especially designed for use on docks, and in warehouses, factories, etc., for conveniently and quickly transferring goods.

**GUN BARREL PISTOL ATTACHMENT.**—Mandal W. Fairbanks, Boonville, Cal. This is a device for holding a pistol parallel with the barrel of the gun, and is so made that the gun constitutes a rest or support for the pistol, the latter being sighted and fired when the stock of the gun is brought to the shoulder in as accurate a manner as though the sight were taken over the barrel of the gun, or one can use the sights on the gun barrel for a long range. The improvement is designed to present decided advantages over a double or three barreled gun, as the weight of the gun is not materially increased, and the attachment can easily be removed and replaced as desired.

**FOOT FOR DREDGES.**—Edward Woods, Sault Ste. Marie, Mich. This foot comprises a post on which are pivoted wings adapted to open and close, while blocks sliding on the post engage the inner edges of the wings to fill the gap when they are in closed or folded position. With this foot a dredge will be securely held in place, and the post with the foot, usually embedded deep in the mud, will readily come up as soon as the dredge swings and raises her anchor.

**HOSE COUPLING.**—Joseph S. Blackburn, Salem, Ohio. One section of this coupling has a shoulder and the abutting section has projecting pivoted spring-controlled jaws adapted for engagement with the shoulder, there being levers connected with the jaws for raising them out of contact with the shoulder. The arrangement is such that the coupling is automatically effected when two sections of hose are brought together and forced to a contact, and means are also provided whereby there can be no possible leak at the point of junction. The uncoupling is quickly and easily effected by the levers.

**HAIR CLIPPER.**—Silas N. Chaney, Grangeville, La. In this device the hair clipped is carried away by an air current, which also serves to carry off any loose dandruff in the hair, the cutting being smoothly and evenly effected, and the whole work neatly done. It comprises a hollow body at one end of which is a slotted plate, a revoluble knife driven by a propeller or wind wheel turning on the inner face of the slotted plate, while a hose leading from one end of the body is connected with an exhaust fan.

**WRAPPER HOLDER.**—Robert E. Glasgow, Richmond, Va. This invention relates to machines for making cigars and cigarettes by hand, and provides a holder designed to greatly facilitate the wrapping of the filler by hand in making high grade goods. A movable clamping plate is arranged to clamp the edge of the wrapper on a movable rolling plate operatively connected with it, and in such way as to permit the operator to straighten out the wrapper and roll in the filler, the two plates forming a rolling surface for completely rolling in the filler.

**SAFE.**—Eben N. Gower, Jr., Flowery Branch, Ga. At one end of this safe is a transverse partition extending from the front to the rear wall, and forming a closed compartment, a safe bolt work being mounted on the door, and a dial shaft extending through the front wall to the rear of the closed compartment, while a bolt-operating mechanism within the main compartment of the safe is connected with the rear end of the dial shaft through the rear end of the partition. Tampering with the combination lock is impossible, as the lock is inside of the safe, and only the dial is on the outside, and the removal of the latter does not affect the lock and bolt mechanism.

**BOTTLE STOPPER.**—Floyd T. Smith, New York City. This device comprises a casing having inwardly extending annular flanges in connection with a valve formed of two semi-spherical sections, with their convex surfaces in contact and secured to a valve stem sliding in supports in openings surrounded by the flanges. When this stopper is in the neck of a bottle, the refilling of the bottle is impossible, although the contents of the bottle may be readily poured out, and the removal of the stopper from the bottle may be readily detected.

**WAGON SEAT.**—Charles C. Field, New York City. According to this improvement a re-enforcing arm extends up over the front edge of the seat onto the top surface of the seat bottom. The invention is an improvement on a former patented invention of the same inventor, insuring the seat being securely held in place on its supporting bar, without danger of breaking or weakening the pivot bolt and other parts.

**HOLDBACK FOR VEHICLES.**—Evangeline Marjeau, Houghton, Mich. A toothed and slotted block is, according to this improvement, fastened on the shaft, and a toothed locking plate is attached to the holdback strap, a locking device being also carried by the locking section. The device is simple, durable and inexpensive, and the two sections may quickly and easily be brought into locking engagement or unlocked, even when one is wearing mits or gloves.

**FENCE.**—John W. Moore, Oakland, O. This invention provides a wire fence that may be readily removed from one place and erected in another. Novel connections are provided for the fence wires, new means for stretching the wires separately, a new device for anchor bracing the fence at the ends, superior means to compensate for the expansion and contraction of the wires and an improved method for the support of iron fence posts where such posts are used.

**SODA WATER FOUNTAIN.**—William H. Ricker, Cambridge, Mass. This improvement provides a casing in which is a revolving partition having a central ice receptacle, around which is a series of apertures designed to hold a number of jars with automatically closing stoppers. Any one of the jars may be readily brought to a certain point to discharge a portion of its contents as desired. The device is very simple and inexpensive.

**AWNING ELEVATOR.**—Frank R. Ashley, Denver, Col. This is a raising and lowering device, comprising two weights traveling in a pocket, and one of the weights having a chamber to receive the other weight, while a cable attached to the smaller weight passes

through the larger one and is connected with the awning, a hoist rope leading to a fastening device being likewise connected with the smaller weight. The mechanism is concealed from view and protected from the weather, and the awning may be adjusted as desired from the inside of a room.

**BOX OR DRAWER.**—Joseph S. Bennett, Winnipeg, Canada. The sides and bottom of this box or drawer are formed of a single piece of metal, the sides being bent up and having inwardly bent right-angled flanges, which lie in kerfs in the sides of the box ends, the bottom ends also having similar flanges lying in kerfs in the bottoms of the box ends, the latter being preferably of wood. In this way is made a light, strong box, free from rough edges or nail heads and well adapted for storing hardware or other heavy goods.

**PAPER BOX.**—George A. Colgan, Brooklyn, N. Y. This box has one elongated flap, which effects a closure of both ends of the box and is capable of longitudinal movement to project the contents of the box, such as cigarettes, slightly beyond the end, to facilitate their withdrawal as desired. Such boxes take a minimum of material, time and labor in their manufacture, are of sufficient strength for many purposes and may be packed in small compass.

**SETTING BAND FOR STONES.**—Charles Betsch, New York City. This improvement provides a setting especially adapted for imitation stones or brilliants, by which the stones will be held more firmly than when attached in the ordinary manner, and the settings will not be separated from the bands. The band has spurs or pins projecting from it, and a stone setting riveted to it by means of the pins.

**MATTRESS FORMER AND PRESS.**—William G. Stuart and Charles H. Delp, Scottsborough, Ala. A box-shaped former has been devised by these inventors, with the ends of the former pivotally connected to its sides, and in connection with which are used longitudinal and transverse dividing boards and pressing strips for binding the mattress after it has been shaped. The device can be easily and quickly adjusted to suit any size which it is desired to make a mattress, and the press is so made that the body of the mattress can be easily inserted into the tick after it has been formed.

**FLY TRAP.**—William A. Hill, Saluda Old Town, S. C. This invention relates to that form of trap in which an endless belt, carried over rollers and driven by clock gearing, is arranged in a frame and baited with molasses or sweetened water to carry the flies under a cage in which they are imprisoned. The improvement provides a very simple, cheap and efficient trap of this description.

**GAME BOARD.**—Charles W. Fishel, Aspen, Col. This board has cushioned walls at the sides and one end, pockets in the cushions and cupped in the central portion, and a semicircular head wall and sloped platform on one end, where also a swiveling and rocking ball-propelling device is located. The game consists in propelling the balls so they will roll into the different pockets, which have varying values.

**ENDOGRAPH.**—Frank W. Haviland, New York City. This invention provides an instrument for the treatment of the uterus, one which will follow the wall of the uterine cavity and of the cervical canal and automatically produce a diagram, illustrating the angles and their length and the shape of the cavity. The instrument can be readily taken apart and thoroughly cleaned.

A flexometer, for which another patent has been issued to the same inventor, affords means whereby the degree of deflection of the uterus may be accurately determined.

**NOTE.**—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention, and date of this paper.

## NEW BOOKS AND PUBLICATIONS.

**A MANUAL OF PRACTICAL ASSAYING.** By H. Van F. Furman. First edition. New York: John Wiley & Sons. 1893. Pp. vi, 390. Price \$3.

The subject of assaying, which of late years has acquired increased interest, in this book receives a much fuller treatment than is usually awarded to it. The size of the book and its number of pages indicate the thoroughness of the treatment. The walls erected between assaying and analysis are every year being broken down, so that we find the present work toward the end drifting into proper analytical work, but throughout the finer methods of chemistry are unhesitatingly adopted, where required for accuracy. It is divided into four parts; the first part introductory, giving the general systems of sampling and other manipulations; the second part devoted to the determination of special things, principally the metals. The third part is devoted to special assays and analyses, such as bullion, copper matte, silver and gold, ores of various kinds, amalgam, coal and coke, white lead, aluminum, natural phosphates, etc. In the fourth part are given chemical equations, stoichiometry or the arithmetic of chemistry, the subject perhaps neglected by the superficial worker, and the calculation of lead blast furnace charges. This last portion is worked out very elaborately, the cost of charges being accurately calculated. An excellent selection of tables closes the book, which is effectively indexed and illustrated as required.

**THE MECHANICS OF HOISTING MACHINERY, INCLUDING ACCUMULATORS, EXCAVATORS, AND PILE DRIVERS. A TEXT BOOK FOR TECHNICAL SCHOOLS AND A GUIDE FOR PRACTICAL ENGINEERS.** By Dr. Julius Weisbach and Prof. Gustav Herrmann. London and New York: Macmillan & Co. 1893. Pp. viii, 332. With 177 illustrations. Price \$3.75.

Translations from the works of Weisbach are always to be welcomed. His thoroughness of treatment and satisfactory formulae make his work exceedingly acceptable to engineers. The subject of hoisting and dredging machinery has, of late years, acquired such importance that

a monograph on the subject is timely and will meet with full appreciation. Levers, tackle, windlasses, hydraulic machinery, cranes and shears, excavators and dredges and pile drivers are samples of the subjects included in this work.

THE ART OF PRESERVING HEALTH. Outlines of practical hygiene adapted to American conditions. By C. Gilman Currier, M.D. 1893. New York: E. B. Treat. Pp. 468. Price \$1.75.

The contents of this work indicate a very full scope. Nothing appertaining to practical hygiene seems foreign to it. Ventilation, food, water, plumbing and sewage, diseases, bacteriology, infection and disinfection are among the topics which it treats.

Beautiful Calendar.—Messrs. Styles & Cash, ornamental printers and stationers, corner of Fourteenth Street and Eighth Avenue, New York, issue every year very handsome calendars, which they present to their customers and friends on the first of January with their greetings.

The "Columbia" desk calendar of the Pope Manufacturing Company is received. It is a pad calendar having space for memoranda for each day of the year, but a portion of each day's leaflet tells something of the advantages of bicycles, and especially of the well known Columbia wheel.

SCIENTIFIC AMERICAN BUILDING EDITION.

JANUARY, 1894.—(No. 99.)

TABLE OF CONTENTS.

- 1. Elegant plate in colors showing a suburban dwelling at Bridgeport, Conn., recently erected for L. D. Plumb, Esq., at a cost of \$4,500 complete. Floor plans and perspective elevation. An excellent design. Mr. C. T. Beardsley, architect, Bridgeport, Conn.

Business and Personal.

The charge for 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 as early as Thursday morning to appear in the following week's issue.

The new material, "Linenoid," Westfield, Mass. "U. S." metal polish. Indianapolis Samples free. Stave machinery. Trevor Mfg. Co., Lockport, N. Y. For mud dredging engines. J. S. Mundy, Newark, N. J. Improved iron planers. W. A. Wilson, Rochester, N. Y.

The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4; Munn & Co., publishers, 361 Broadway, N. Y.

Competent persons who desire agencies for a new popular book, of ready sale, with handsome profit, may apply to Munn & Co., Scientific American office, 361 Broadway, New York.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication. References to former articles or answers should give date of paper and page or number of question.

(5699) H. C. writes: I have a two cell electroplating battery. When I want to plate a wax matrix I am unable, after brushing same with black lead, to make it a conductor. I wish to electrotype on a small scale and would like to have these questions answered: 1. The batteries are common telegraph (zinc, copper and blue vitriol). Will such batteries (two in number) furnish a current sufficient? How can I increase the current? How can I make a wax matrix a conductor? A. After the black lead has been applied sprinkle iron dust on your wax. This will start the plating.

(5700) J. F. writes: 1. I have a magneto machine that was used on a telephone circuit. Will you please tell me whether I can use it to run a small model of an electric motor? A. Not if of the ordinary alternating current type. 2. I have an electric motor of 1-16 horse power. Can you please tell me what power will be required to run it and get the full power out of it? A. 1-16 horse power or a little more. The volts required should be marked on the machine.

(5701) A. W. writes: 1. In SCIENTIFIC AMERICAN of October 28, Notes and Queries, No. 5442, you say a 14 inch wheel, 96 pitch, but do not mention number of blades; please do so, as I do not know the kind of wheel to get until then? A. Use a three-bladed screw. 2. I am making an Edison pattern dynamo of following dimensions: Fields 2 1/2 inches long by 1.3-1.6 diameter, with twelve layers of No. 24 wire on each, 12 ounces on both; field pieces are 3 inches long, bored for 1 1/2 armature diameter. What number of wire, number layers, number convolutions, and 12 commutator bars is proper for the armature? A. Your armature should have 90 ohms resistance. This would be given by No. 30 wire wound in three layers, giving about 1,300 convolutions. The dynamo would have a capacity of 0.4 ampere. This is for series winding.

(5702) W. R. L. asks: In microphone transmitters there seems to be a great diversity of opinion as to the why. Some say it is the variable pressure, others the movable contact, or the heat generated, etc. What is the most probable theory? Some use large contact surfaces, while others use mere points. Which is the

best, or are they both best according to the manner of use? A. Variations in resistance, due to more or less contact between the surfaces, is the "why" of it. This greater or less contact may be brought about by greater or less pressure or greater or less areas of contact. Absolute separation produces jarring sounds. Your last surmise is about correct, though larger surfaces are now preferred.

(5703) G. F. H. writes: 1. What is the reason that in an incandescent electric lamp of 50 volts you unscrew the globe and touch the standard of two of them, the shock does not feel as strong as in a common 2 volt cell battery? Sometimes the current cannot be felt at all in the incandescent lamp. A. If you touch the similar poles or terminals, there will be little shock unless a ground exists. If opposite poles, the shock may be severe, and in case of an alternating current system, any touch may be fatal. The standard proper is insulated from the wire and should give no shock. 2. Why is it that by wetting your fingers you can get more of a shock than by using dry fingers? A. It improves the electrical contact. We strongly advise you not to touch any terminal, as it may produce instant death.

(5704) V. G. A. asks what Chatterton's compound is. A. Chatterton's compound is made of—Stockholm tar..... 1 part. Resin..... 1 part. Gutta percha..... 3 parts. Address any dealer in electrical supplies if you wish to buy it.

(5705) F. J. T. asks: 1. What is the depolarizer used in bichromate batteries? A. The chromic acid of the alkaline bichromate. 2. How can I find tables for winding motors, etc., to get fractional parts of, and horse power? Also resistances, so as to wind electro-magnets, etc.? I have "Experimental Science," but cannot find what I want. A. These have to be calculated. Examples of dynamo and magnet calculations are contained in Sloane's "Arithmetic of Electricity," \$1 by mail. 3. How can I find how to make a small gasoline engine? A. We can only refer you to books, but it is doubtful if you can build one from books alone. We recommend and can supply you with the following books relating especially to the subject you refer to: Robinson's "Treatise on Gas and Petroleum Engines," price \$5.50; also Clerk's "Treatise on the Gas Engine," price \$2 mailed.

(5706) S. S. D. says: Will you please tell me how to make a good composition for printers' rollers? A. Best glue..... 10 1/2 lb. Black molasses or honey..... 2 1/2 gal. India rubber, dissolved in oil of turpentine..... 1 lb. Venice turpentine..... 2 oz. Glycerine..... 12 oz. Vinegar..... 4 oz.

The above formula is given for the mysterious black composition, so durable and elastic, and known but to very few persons until recently. Purified India rubber only is used. To recast add 20 per cent new material. The common receipt for printers rollers is 2 pounds best glue, soaked over night, to 1 gallon New Orleans molasses. Will not recast.

(5707) G. F. T. asks (1) how to make a good solder for mending tinware, one that does not require acid to solder with if possible. One that will solder sheet iron. A. An alloy made of 4 parts tin, 2 parts lead, 1 part bismuth, makes an easy-running solder for soldering with an alcohol lamp. Tinned articles can be soldered without acid, but untinned articles as sheet iron must be made clean and tinned with acid. 2. Can you tell me how to make ordinary glass vials untransparent entirely? A fluid to wash them in I would like to know of. A. The fluid hydrofluoric acid is used for making gas translucent, the fumes answering the same purpose; it is a most dangerous poison and is not recommended for use by amateurs. Coarse emery shaken in the bottle with buckshot, or the outside of the bottle inclosed in a box with emery and shot and well shaken, will produce the desired effect.

(5708) L. S. F. asks: Practically, how close to the wind can a first class yacht sail? That is, what is the minimum angle between the yacht's path and the direction of the wind, allowance being made for leeway? A. Much depends upon the model and trim of sails, in the ability of yachts to sail close to the eye of the wind. Fine lines and flat sheets may carry a yacht up to two points of the wind, say 22 degrees off, but a large class cannot sail nearer than 3 points or 33 degrees.

(5709) L. E. R. asks: 1. Is there any known substance that will dissolve carbide of silver? A. If such a compound were produced, it would probably dissolve with decomposition in nitric acid. 2. How may one change a formula written in parts, where liquids as well as solids are in parts, to apothecaries' fluid measure, also dry? A. Parts generally mean parts by weight. Substitute in the solid parts grains or other units, and for the liquids equivalents in liquid measure, having regard to the specific gravity of the fluids. Tables of equivalents are given in the text books.

(5710) G. L. R. asks: Please answer in your Notes and Queries (1) how the compass is kept from being attracted by the mass of steel around on the man-of-war? A. Special constructions of compass are made, shielded from the influence of the ship. 2. I have 6 cells of the Daniell's battery, copper on the outside of the porous cup in blue vitriol and water, and zinc on the inside of the porous cup in salt and water; please tell me what the copper color substance is that forms on the outside of the porous cup and how I can remove it without taking pieces out of the cup when I try to remove the substance. A. It is metallic copper. You can remove it by dissolving in nitric acid. It may be cheaper to get a new cup.

(5711) M. S. P. asks: How many cells of storage battery are required to run the electric motor described in SUPPLEMENT, No. 641, also the number and size of the plates in each cell of storage battery? The number of cells of gravity battery required to charge the storage battery and the time required to charge the same? A. Two cells, each having one square foot of positive plate. To charge slowly, 5 gravity cells will answer. By using parallel series of 5 gravity cells the charging can

be accelerated. We advise not less than 20 gravity cells in 4 series of 5 each.

(5712) H. O. G. asks: What will clean a boiler of lime where you carry 15 pounds of steam to heat a building without injuring the boiler? A. Charge the boiler through the feed with a half pound of caustic soda for each nominal horse power, through the feed or in any convenient way. Use the boiler a week and then clean out thoroughly. If there is means for blowing off the boiler, a less quantity used at stated intervals, and the water partially blown out, will keep the boiler in good condition.

(5713) N. A. W. asks: It is quite generally known that carbonic acid gas is deathly poisonous, and we are also told that carbonic acid gas gives the palatable, sparkling, and exhilarating taste to champagne, beer, etc. If one is poisonous and the other healthful, why should the two gases have the same name? A. Carbonic acid gas if inhaled tends to asphyxiate or drown by exclusion of air. It is possible that it also has a poisonous effect when drawn into the lungs. In drinking champagne very little or none of the gas gets to the lungs, and its presence in the wine does not interfere with respiration. A lung poison is not necessarily a stomach poison. The gas is the same—there are not two gases of the same name.

TO INVENTORS.

An experience of forty-four years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices which are low in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

January 9, 1894,

AND EACH BEARING THAT DATE.

(See note at end of list about copies of these patents.)

Table listing inventions and their patent numbers. Includes items like Address labels, machine for attaching, A. Heim... 512,926; Asphalt, refining, E. D. Upham... 512,434; Auger handle, D. W. Meacham... 512,384; Auger, post hole, A. De Witt... 512,540; Automatic lubricator, Slater & Barrett... 512,402; Axle cutting machine, C. H. Woodall... 512,490; Bale tie machine, W. A. Laidlaw... 512,426; Baling press, J. Heaton... 512,294; Ball, See Billiard ball... 512,450; Balloons, parachute sail for, T. Schneider-Preiswerk... 512,320; Bandage, F. W. Pulford... 512,384; Bar, See Car draw bar, Locomotive draw bar... 512,404; Basket, shipping, Springer & Evison... 512,404; Battery, See Secondary battery... 512,577; Battery, W. M. Stine... 512,577; Bearing, anti-friction, J. C. Lafreniere... 512,435; Bell for doors, tables, etc., I. L. Garside... 512,435; Bending machine, D. R. Cowan... 512,366; Bicycle, Clark & M. Thompson... 512,538; Bicycle seat posts, support for, L. S. Kallajian... 512,379; Bicycle speed gearing, McKenzie & Brock... 512,479; Bicycle stand, F. G. Hurlbut... 512,548; Bicycle wheel, E. Stenersen et al... 512,453; Bicycles, tricycles, or other velocipedes, means for adjusting the driving chains of safety, A. Blackwell... 512,357; Billiard ball, T. Neumann... 512,391; Boiler, See Straw burning boiler... 512,524; Boiler covering, T. Sparham... 512,536; Boiler furnace, steam, T. R. Butman... 512,536; Boiler tubes, device for cutting, C. O. Thieme... 512,631; Boot or shoe, A. M. Thompson... 512,412; Bottle, etc., H. R. Harper... 512,374; Bottle shaping implement, A. L. Straus... 512,409; Bottle stopper, C. Huch... 512,652; Bottles, machine for wiring corks in, G. C. Coon... 512,281; Bottling machine, W., Jr., & S. C. Childs... 512,432; Box, See Fruit or berry box. Letter box. Mail box... 512,517; Box fastener, A. Ottenbeimer... 512,517; Box for cigars or other articles, J. Frazee... 512,519; Box or coop, convertible, G. Bernhard... 512,509; Brake, See Car brake... 512,673; Brewer's grains, apparatus for drying, A. Mason... 512,673; Brick kiln, C. A. Mowbray... 512,597; Broom holder, F. E. Allen... 512,597; Brush, F. J. Clarke... 512,363; Buttonhole cutter, C. A. Shultz... 512,452; Camera, See Panoramic roll holder camera... 512,601; Camera shutter, H. B. Carlton... 512,601; Can, See Oil can... 512,403; Can fluxing mechanism, J. Solter... 512,323; Canning machinery, E. R. Pruitt... 512,323; Car and pipe coupling, combined, G. T. McCrea... 512,619; Car brake, A. Hendee... 512,376; Car brake, H. Thompson... 512,588; Car brake beam, railway, D. L. Barnes... 512,497; Car coupling, C. Washburn... 512,456; Car coupling, C. E. C. Edey... 512,507; Car coupling, T. Forstner... 512,286; Car coupling, L. Pix... 512,661; Car coupling, J. Rawles... 512,386; Car coupling, J. C. Taylor... 512,630; Car coupling, C. Washburn... 512,456; Car coupling, automatic, P. McMullan... 512,389; Car door fastener, T. Eubank... 512,467; Car draw bar, railway, J. A. Sample... 512,438; Car loader, F. W. Bond... 512,575; Car safety stop, A. B. Trenner... 512,341; Car sand box, H. McPherson... 512,480; Car seat, railway, E. B. Cushing... 512,345; Car, tank, E. W. Mackenzie-Hughes... 512,297; Car, vestibule, J. Meeban... 512,513; Cars, metallic draught sill for, T. C. Salveter... 512,329; Carding machine feeding device, T. Kershaw... 512,443; Carding machines, rubbering apron for, J. Barker... 512,530; Carpet stretcher, S. Livingston... 512,345; Carpet stretcher and tacker, D. H. McFalls... 512,659; Carriage jump seat, J. Miller, Jr... 512,618; Case, See Histological case. Packing case... 512,641; Cash register and check printer, motor driven, C. W. Weiss... 512,639; Cash register, indicator, and recorder, C. W. Weiss... 512,639; Cash register, recorder, and check printer, C. W. Weiss... 512,640; Cattle guard, J. T. Hall... 512,509; Chart stand and easel, combined, H. E. Holt... 512,471; Chest banking, C. H. Willis... 512,420; Chimney, A. Custodie... 512,504; Chimney, sectional ventilating, S. H. Richmond... 512,363; Chuck, lathe, C. F. Elliott... 512,283; Churn, M. O. Barke... 512,574; Churn, working body, G. H. Smith... 512,628; Cloth pressing machine, E. Gessner... 512,610; Clutch, J. N. Webb... 512,643; Cock stop, A. Campbell... 512,537; Commutators of dynamos, device for blowing out sparks on, H. W. Hanahan... 512,612; Compound engine, A. J. L. Loretz... 512,306; Concrete mixing mill, E. L. Ransom... 512,623; Copying apparatus, Miller & Covell... 512,446; Cooker, steam, J. P. Tallant... 512,389; Cooking vessels, device for carrying off odors from, B. F. Fowler... 512,650; Cooler, See Lard cooler... 512,658; Copying press, J. H. Smith... 512,658; Cores, machine for making foundry, E. Grant... 512,389; Corn cutting and shocking machine, H. McPherson... 512,314; Corn husker, F. Crook... 512,367; Corn husker, green, W. F. Dana... 512,423; Cotton gins, combined beater and carder for, W. P. Kopper... 512,445; Coupling, See Car coupling. Car and pipe coupling. Pipe coupling... 512,445