RECENTLY PATENTED INVENTIONS.

Engineering.

ROTARY ENGINE. — Arthur Tickle, Brooklyn, N. Y. A piston is mounted to rotate within a cylinder, a gate being held to slide in the cylinder and forced against the piston by live steam, there being a steam chest on top of the cylinder, with a slide valve, with which exhaust valves simultaneously move, and other novel features, designed to utilize steam to the fullest advantage, and be readily reversed.

SPEED INDICATOR.—Elumet N. Barber, Kent, Ohio. This invention covers various novel details and combinations of parts, and is based on the principle of forcing a certain volume of liquid, as alcohol, oil, etc., through an aperture at a certain pressure in a certain time, the volume being increased or diminished without changing the pressure or the time, by increasing or decreasing the size of the aperture.

SPEED INDICATOR.--The same inventor has patented a further invention covering a compartment in which operates a piston actuated by the pressure of a continuous stream of a fluid forced into the compartment by a device actuated by the moving part the speed of which is to be indicated, the second compartment being filled with the same fluid and having a piston which compels the other piston to change its position slowly, in connection with a dial and pointer operated from the main shaft.

FURNACE.--Gottfried Pietzka, Witkowitz, Moravia, Austria-Hungary. This is a rotary double flame furnace, for use in puddling or welding pig iron, or for manufacturing Martin steel, the furnace being adapted to be turned so as to avoid loss of heat and time in clearing away the iron, and also to increase the quantity and improve the quality of the product, the invention covering various novel details and combinations of parts.

Electrical.

CURRENT REGULATOR. — Joseph W. Balet, New York City. This invention combines a series of storage batteries with a series of switches under control of the main current and the motor, by which the current not used and any surplus will be sent into accumulators to be stored for future use, and to control the charging of the secondary batteries, so that the current shall cease in a particular battery when the maximum charge is reached.

CURRENT REGULATOR.—The same inventor has patented a further invention consisting in a translating device formed of a helix and a pair of soft iron bars supported movably in the helix, each bar being connected with a switch arm adapted to move between a pair of contacts connected with the circuit in which the helix is placed, the device being adapted for use in connection with any electrical circuit, but especially for use with storage batteries.

Mechanical.

WIRE DRAWING MACHINE.—Frederic Smith, Halifax, York County, England. This machine is arranged to draw several wires simultaneously, each wire being reduced by drawing it through a series of dies by means of drawing-through pulleys driven at gradually increasing speeds, the objects of the improvement being to increase production and diminish the cost of such machines.

SHUTTLE MOTION.—William F. Hitchcock, Homer, N. Y. By this invention the shuttle is carried back and forth in a positive manner, and not thrown, the shuttle being adapted to hold a circular disk bobbin that carries the filling thread or wire, and actuated by hollow shuttle carriers, the automatic catching and releasing of the shuttle from the carriers forming an important feature of the invention.

DRILLING MACHINE.—Richard Hammond, Buffalo, N. Y. This is a central drilling tool, with two outer drilling tools held parallel therewith, and mounted in bearings to swing from the central tool, making a multiple drilling machine especially adapted for drilling apertures for the rivets in boilers when the plates are in place.

RAIL DRILL. — Meritt W. Smith, Waverly, N. Y. This is a machine which has a frame carrying a rotating and endwise movable spindle, with gearing for rotating the spindle, and other novel features, especially adapted for drilling fish plate bolt holes in railway rails, with economy of time and labor, the drilling tool being automatically fed.

SCREW DRIVER. — Carl A. Strasser, Baltimore, Md. This is a compound tool intended for use by piano makers and repairers, carpenters and others, and is designed for use in turning screws in corners or other obstructed positions, while it has a handle bar with notches or slots to receive pins or wires, to straighten them when bent.

WRENCH.—Joseph Tomlinson, Folsom, Cal. This invention covers a novel construction and arrangement of parts in that class of wrenches in which the jaws are pivoted within a frame or casing and are caused to clamp the nut by a sliding handle engaging the rear end of the jaws, and in which the lever jaws can be held locked in a closed position when desired.

STAVE MAKING MACHINE.—William J. Wright, Cooperstown, Pa. This is a machine wherein the billet passes through the various stages necessary to complete the stave, and as it progresses, automatically controls and sets the cutting devices so as to cut both the bevel and form the bilge of the stave in exact proportion in relation to the width of the billet.

Agricultural.

DRAG AND HARROW.—John R. Goodman, Calumet, Mo. The drag and harrow are each composed of jointed sections, the two being hinged together so that they may be used interchangeably if desired, or the drag may be used to break the clods and level the ground, while the harrow following just behind will loosen up the soil and prepare it for seeding.

STACKER.—Thomas Berry, North Fork, Ky. Combined with a base frame is a vibratory and vertically rocking table mounted thereon, and a trunk mounted upon the table, wherein the straw or hay will be continuously conveyed from the thrashing machine and deposited at a distance in advance of the trunk in a semicircular rick.

SHOCK BINDER. — Christian Beu, Moline, Kansas. This invention relates to a light and readily portable device for compressing shocks of corn or grain, while also providing a means for expeditiously and conveniently tying the shocks when compressed, the invention covering various novel features of construction and combinations of parts.

GRAIN SCOURER. -- Peter Provost, Menominee, Mich. This invention covers novel details and combinations of parts in a machine for scouring and cleaning grain, in which the process is facilitated by causing the kernels to rub against each other and against the several parts in the interior of the main cylinder of the machine.

Miscellaneous.

MEAT BROILER.—Annie Caller, Albany, N. Y. This broiler consists of a folding skeleton frame so connected to guide rods on the base as to be readily moved to either end of the base and either member of the frame presented to the fire, to provide for the ready turning of the meat without removing it from the broiler and without removing the latter from the fire.

STOVE OR RANGE.—George G. Kniffin, Brooklyn, N. Y. This invention provides a counterbalance drop door specially adapted for use at the oven, the door being attached in a simple and durable manner, and means being provided whereby the doors will be easy of access in case repairs are needed.

FRUIT DRIER. — Henry A. Crandell, Harrison, Ark. The drying chamber of this apparatus has movable supports on which the trays rest, projecting into the chamber, and a rotary shaft with eccentric disks which engage and move back the supports and release and lower therefrom one tray at a time, the green fruit being introduced at the top of the chamber, and removed from the bottom when dried.

STEAM RADIATOR.—Daniel H. Streeper, Norristown, Pa. This invention covers an apparatus in which are combined telescopic tubes for regulating the discharge of water from steam radiators, for the purpose of varying the steam room of the radiator, according to the amount of heat required.

NEEDLE.—Samuel M. Neely, Smith's Turn Out, S. C. This is an eye point needle designed to be used by hand for sewing bags and other coarse work, and is adapted to carry its own ball of thread, while the needle may be of the longitudinally grooved description or otherwise.

FOLDING STEP. — Harrison T. Cork, Marshall, Ill. This step consists essentially of a casing with a spring plug and arranged for connection with a vehicle body, a standard moving vertically within the casing, and a step hinged to an arm carried by the standard, making a vehicle step adjustable as to height, and which can be folded out of the way when not in use.

TRUNK FASTENER.—Joseph R. Shoemaker, Durango, Col. This is a corner brace for trunks, valises, and similar articles, to facilitate roping and strapping the trunk or package after it has been locked, whereby the rope is kept in place and prevented from slackening and slipping off, and the binding rope is prevented from being cut by the angular portions of the trunk.

DUMP CART. — Hartwell A. Wilkins, New York City. The cart body is rigidly mounted upon a cranked axle to which the shafts or thills are connected by hinge joints, the body being held from accidental dumping by a tongue carried by a vertical crank shaft and engaging a keeper secured to the body.

SHIPPING PACKAGE.—Isaac L. Rock, Mooers, N. Y. This invention provides a simple and inexpensive fastener for the covers of butter tubs, pails, etc., a square loop being pivotally connected to one side of the pail and a loop to the opposite side, upon the free end of which turns a cam lever, the lever being turned downward over the cover to hold the latter in place.

GATE.—George Ford, New Harmony, Ind. This gate is made with inclines, means for lifting the gate, and bearings for the inclines of the gate, such bearings being movable, giving a compound movement of the gate, part by the movement of the bearings in their guides and part by the inclines of the gate moving down the bearings.

DYNAMITE.—John Waffen, Hancock, Mich. This invention covers a new composition of matter to be used as a high explosive, the composition not being affected by moisture, and not susceptible of change except when exposed to a temperature exceeding 110° F. It consists mainly of nitrate of soda, decayed wood, sulphur, carbonate of soda, and nitroglycerine having collodion mixed with it.

INSECTICIDE. — James M. A. Miller, San Mateo, Fla. This invention covers a process of producing an insect-destroying compound especially designed for use on fruit trees, and consists in adding sulphur to lime while the latter is being slaked and afterward dissolving the ingredients in water.

FULLING WOOLENS.—Reuben C. Rutherford, New York City. This invention covers a method of restoring shrunken woolen fabrics to their original dimensions and texture, the method consisting in first steaming the fabric to soften the fibers, then stretching the steamed fabric while moist and heated, and finally drying the fabric.

CAMERA SHUTTER.—William Shakespeare, Jr., and Garrett W. Low, Kalamazoo, Mich. This invention relates to camera shutters, in which a pair of swinging slides or wings arranged to approach and recede from each other are used to cover or expose the opening in the camera which faces the lens through which light is admitted when making an exposure, the invention covering special means for operating the slides, and special construction for taking stereoscopic pictures, with various other novel features.

HARMONIGRAPH. — Joseph A. Decuir, New Orleans, La. This is an apparatus by which music, as played on a piano or other instrument, may be suitably indicated on a sheet of paper, the construction being such that paper is fed steadily forward and lines drawn thereon, the lines being broken by depressing the keys, the breaks in the lines indicating the notes, and the length of the breaks indicating the time due the notes.

PAVEMENT.—Murty Cunningham, Bellefonte, Pa. This is a composite pavement, the composition consisting of broken stone or its equivalents, coke screenings or screened coal ashes, coal tar, sulphur, a coloring material, and tallow, there being applied to the top layer a mixture of coal tar, sulphur, coloring material, and hot tallow, the composition being about five inches thick, in several layers, where the wear is heavy.

STOVE PIPE VENTILATOR.—George L. Jones and Eusebius M. M. Miles, Chippewa Falls, Wis. This is an attachment for the draught pipes of cook stoves, in which a hood is held over the stove to receive the smoke, gases, etc., the improvement providing for the ready adjustment of the hood to give convenient access to the stove, and affording means for moving parts of the hood without disturbing the remainder.

SAFETY GUARD FOR RAZORS.—Terence F. Curley and Albert S. Granger, Brooklyn, N. Y. Combined with a tubular razor back pivoted in a handle is a razor blade inserted in the back and a swinging reversible guard pivoted upon the razor back, and capable of swinging against either side of the blade, the reversible guard having oblique ribs or corrugations on opposite sides.

SAFETY GUARD FOR RAZORS. — The same inventors have patented a further invention in which, combined with a slotted tubular back, provided with a hollow shank and a razor blade held by the back, is a guard which may be swung back from the edge of the razor blade, to permit of shifting the blade and sharpening the razor, the object of the guard being to prevent the razor from cutting the flesh.

PARALLEL RULER.—Sherman M. Goss, Council Bluffs, Iowa. This rule consists of a blade connected by links with a second blade extending parallel with the first one, both blades being provided with inclined flanges having graduations.

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 next issue.

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.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(508) F. S. asks: 1. Can you tell me which will weigh the heaviest, salt (sea) or fresh water, and if any difference? What is the cause? A. Sea water is the heavier, because of the salt dissolved in it. 2. My parents were born in Germany, I was born in America. Am I American or German-American? A. You are American. 3. What causes earthquakes? A. The cause is unknown.

(509) J. A. C. writes: In our water works system at this place we are troubled with the flow of water stopping at the bibs with good pressure in mains (30 to 40 pounds) and good flow next door. There is no more sign of pressure than there would be with stop shut; the water will start again of its own accord, it may be in 10 minutes, and may be in 2 or 3 hours. Every one tells us it is an air trap. Now what we want to know is, what is an air trap, with the reason why the water will not flow through a pipe with one end open to the atmosphere and the other under pressure? A. Probably your main pipe is too small for the service. With small mains and many service pipes, where at certain times many are drawing water at the same time, at the lowest level the bibs will run and draw air in at open bibs on a higher level, the air becoming an obstruction by retarding the flow of water to

lower levels, the air always seeking the highest points in the system of mains. This is called an air trap. The high points in the system should have self-acting valves or a service connection to let the air out, but this will not obviate the tendency to air obstruction in mains that are too small for a distributing service. We could not point out your special trouble without a map and elevation of the whole system of mains. Service pipes should always be tapped in to the top of the mains.

(510) E. L. B. asks: How many ohms of resistance will one volt of E. M. F. overcome? I can read up all about one unit and all about the other unit, but cannot ascertain the relation between the two. If there were a unit for the friction of water in a pipe, it would be easy to say, so many pounds of pressure overcome so many units of friction; cannot the same be ascertained for volts and ohms? A. Any number of ohms resistance can be overcome by one volt E. M. F. The resistance simply reduces the amount of current that can be produced by a given E. M. F. through the circuit. Thus, taking your own simile, no amount of friction could completely overcome one pound of water pressure; it would only reduce the amount which that pressure could force through the pipe. Read Ohm's law to ascertain the relation of E. M. F. to current. It states that the current produced by a given E. M. F. is inversely proportional to the resistance of the circuit. Hence any E. M. F. must produce some current through any resistance short of infinity.

(511) C. T. H. asks how to calculate the size of wire on armature and field magnets of electric motor with any given E. M. F. A. For a peripheral speed of armature of about 1,500 feet per minute, and as an approximation, for every yard of wire in its winding, one volt E. M. F. may be allowed for.

(512) V. M. C. asks: How must I proceed to obtain a cast of solid metal, say of silver, of a bug, beetle, or similar insect? The idea is to embed the object in some plastic refractory material, then burn it out, and pour the molten metal through holes provided. What material must I use, and how must I proceed? A. Make the moulds of finely ground plumbago 3 parts, potter's clay 1 part. Mix thoroughly with water, and thin enough to run. Make a small paper box open on one side, and impale the insect on large pins passed through the box and into the insect to hold it in position and for ventilation. Let some of the pins touch the legs, also for ventilation. When the insect is properly adjusted in the box, and a large pin or pouring gate is made to touch the body, and held in place by passing through the box, pour the thin mixture slowly into the box until it is filled, being careful to clear away any air bubbles that might hang in contact with the insect. Set the mould in a warm place to dry. As soon as it is set or hard enough to handle, pull out the pins and gate and take off the paper box and place in a warm place to thoroughly dry. Then place it in a small iron box, so as not to expose the mould to sudden heat, and slowly heat to a full red, and while at a red heat blow air through the mould to burn any carbon that may remain. See that the vent holes and gate are all clear, when the mould will be ready for pouring in the metal. Have the mould quite hot when you pour, to insure the metal filling every part. Soak the mould in water for a few hours, when it can be cut away with a knife.

(513) M. C. J. and L. J. S. ask how marble that has become stained so that it looks dirty can be whitened. A. Scrub it with ground pumice stone and water. For stains apply a paste of lime and washing soda and wash off after a few hours. Also try javelle water, or bleaching powder and water mixed to a paste.

(514) H. N. asks how table oil cloth may be made. A. Size it with weak glue solution and paint with best lead paint, mixed with a little varnish. It can be rubbed down between successive coats with ground pumice if a very fine finish is desired. Dammar varnish can be used.

(515) A Subscriber asks why they don't use emery paper on an electric motor. A. Emery is a bad material to use on any frictional surfaces or bearings in any class of machinery, as it beds itself in the metal and cuts the journals, etc. Hence it is not used to brighten the commutators, as they would then destroy the brushes.

(516) J. H. A. writes: I wish to take a plaster cast from a plaster ornament, but have trouble in separating same. Can you tell me what to use on the original so that they will admit of free separation? A. Oil the mould with olive or similar oil.

(517) T. O. M. asks: Will the telephones described in SUPPLEMENT, No. 142, work a distance of ten miles? A. No; you will need a microphone transmitter. 2. Would I be permitted by Bell Telephone Company to use them? A. They are practically Bell telephones, and the Bell company can have you enjoined from using them.

(518) N. W. H. writes: In your SCIENTIFIC AMERICAN of February 18, 1888, you give the population of London, England, for 1888, 3,955,819. Swinton's geography gives the population of same city for 1880, 4,764,000. Has the city decreased in population, or have you made a mistake? A. Our figure was correct. The population of London may be variously stated, according to the districts in the suburbs which are included. Instating the population of New York as a center of population, Brooklyn, Jersey City, Hoboken, Long Island City, etc., should be included. London's population is increasing with great rapidity.

(519) E. H. J. asks: 1. Please give origin and history of three golden balls as a pawnbroker's sign. A. The coat of arms of Lombardy contained three spheres, and is said to have been the origin of the pawnbroker's sign, as Lombardy was the home of some of the first of this class. 2. Is there a treatise on the improvement of memory? A. Holbrook's "How to Strengthen the Memory" is a popular treatise, which we can send free by mail for $1.00.

(520) J. S. writes: I have constructed an eight lamp (16 c. p.) dynamo-electric machine, according to instructions given in SCIENTIFIC AMERICAN SUPPLEMENT, No. 600, by G. M. Hopkins, but have failed to generate any current from it. The instructions given have been strictly followed. The machine runs well as a motor with four Grove cells. Will you please inform me the reason, or suggest what is necessary to obtain the desired effects? A. Possibly you can obtain a current by shifting the wires of the field magnet so as to send the current through the field in the opposite sense. Or try the following: Connect the field and armature in series with a battery of four or five couples and start the dynamo. Have the wires insulated and the brushes set at the neutral point. The instant the belt seems to drag, indicating an excited field, cut the battery out and close the circuit. This must be done quickly or you may lose the excitement of the field. Do not touch the bare wires when executing the maneuver, or you will get a strong shock.

(521) F. B. W. writes: Will you kindly inform me through your paper the process of making blue print paper—body white, lines blue? I have seen it in your paper, but cannot turn to it. A. For processes both of blue lines on white ground and black lines on white ground, we refer you to our SUPPLEMENT, No. 584, with full description, formula, etc.

(522) J. G. W. writes: I am building an eight light dynamo as described in SUPPLEMENT, No. 600. 1. I wish to use it for an arc light; which is the best winding for it—series or shunt? A. For arc lamp wind in series. 2. Could it be run by hand power with proper transmission for several hours? A. It would not be practicable. 3. Which is the best transmission for it? A. Belting. 4. How can I make an arc lamp for that purpose? A. For arc lamps consult our SUPPLEMENTS. We recommend also Atkinson, "Electric Lighting," which we can supply by mail for $1.50.

(523) J. V. L. P. writes: Can you tell me what has been found efficacious for removing mildew from brickwork? A brick building near here has presented about 100 square feet of mildewed surface on one of its gable ends ever since it was built, some eighteen months since. The mildew is a clear white, and varies a little from time to time in extent, but is as bad now as ever. I have thought of using several liquids for removing it, but would be glad to learn what others have found suitable. Perhaps nitric acid would destroy the mildew, but I fear it would eat into the mortar at the joints and necessitate repointing. How is it with boiling water, kerosene, lye, or ammonia? Will the application of any substance prevent the reformation of the mildew—boiled linseed oil, perhaps? A. Builder's acid (muriatic acid) is often used for removing white stains from brickwork. Its efficacy in the case of mildew would be doubtful, but the white stains you refer to may not be such. A coat of linseed oil on the perfectly dry brick would have a good preventive tendency. Melted paraffine applied hot and worked in with a paint burner would also be efficacious. Perhaps either of the last named applications would destroy the mildew or white stain also. Acid used by an experienced man would not injure the joints.

(524) A. L. K. writes: A shunt-wound incandescent dynamo, voltage 1,200, current 5 amperes, furnishes light for 100 16 candle lamps, wired in series. Each lamp has 2½ ohms R. and consumes 12½ volts. An arc lamp is inserted in the circuit, in series, requiring 50 volts and 5 amperes, and giving a nominal candle power of 1,000. It displaces four 16 candle lamps. I cannot understand why the same power furnishes 64 candle power in one case and 1,000 in the other. A. The 1,000 candle power rating is fictitious, and really is about 400 candles. The arc lamp is the most economical producer of light that is known, because of its high temperature. The ratio of obscure to luminous radiations is far more favorable than in the case of the incandescent lamps.

(525) "Reader" asks: Is not the field for invention nearly exhausted? Do you know of any opportunities still open for one with an inventive turn of mind? A. The opportunities are endless; the field is rather increasing than diminishing. We could not recapitulate a tithe of the most important. Thus we might suggest a light weight durable storage battery; a low resistance, compact, cheaply run primary battery; a high temperature heat engine; a practicable freight train brake; a coupling for attaching automatically ferryboats to their docks; a practicable system of navigation in fogs on the ocean. Every machine of importance can be made the basis for improvements. To be a successful inventor you must see the need as well as the way of supplying it; the first is as essential to success as is the second.

(526) P. V. M. asks whether common pine wood or any wood could be made to answer for cores in casting Babbitt or lead. If not ordinarily, could it be made good by any solution? A. Boil the wood for a few minutes in a strong solution of sulphate of iron, dry, and whitewash with lime and again dry, for each cast.

(527) A. A. asks if there is any method to separate alkali from water to make it suitable for drinking. A. Distillation is the only efficient method.

(528) B. & Co. ask for the best methods of quickly bleaching ivory. A. Treat with solution of binoxide of hydrogen. Exposure to the sun while immersed in spirits of turpentine is said to be efficacious.

(529) H. A. W. asks: Kindly state between what zodiacal constellations and the sun are the planets Saturn, Uranus, and Neptune when passing the perihelion point of their different orbits. A. The position of the perihelion of Saturn is in Cancer, of Uranus in Virgo, of Neptune in Taurus.

(530) E. J. K. writes: Will you give formula for adhesive plaster that is unaffected by moisture and is as inert, medicinally, as possible? What is wanted is something that will stick to the body well. A. Oxide of lead 4 pounds, olive oil 1 gallon, water 3½ pints; simmer together for four or five hours, adding water if necessary until the mass is of proper consistence.

(531) F. H. S. writes: At any time during clear weather, when the temperature is below the freezing point during the night, but not sufficiently low as to "freeze over" the water of a river or creek, at no time before sunrise can a particle of ice be seen upon the surface of the water, while in a short time after sunrise, the stream, as if by magic, is filled from shore to shore with floating particles of ice, commonly called slush ice. Query: Whence comes this ice? A. The fine ice we presume existed, but was invisible until the sun's rays fell upon it not too obliquely.

(532) J. S. B. writes: To settle a dispute, will you please tell me, if you should pass an electric current through a chemically pure copper wire, would there be any difference in composition (*i. e.* would it still be chemically pure) or structure? I think that an electric current would not alter the composition or structure, unless the wire was so small as to cause heating. A. You are correct. No alteration in composition will be produced.

(533) E. H. D. writes: Is there anything in benzine that will injure the teeth? If not, it is certainly a great cleanser. How can it be purified from its peculiar taste and smell? A. Benzine will not injure the teeth, but is not adapted for cleaning a wet surface, and its vapor, if inhaled, would tend to produce toxic symptoms. Treatment with bichromate of potash and sulphuric acid tends to destroy its odor.

(534) G. S. D. asks: 1. Why is it that you can place your hand on the bottom of a boiling tea kettle and it will not burn you, only feeling warm to the naked hand? A. If the bottom of the kettle is coated with a non-conducting substance, such as lampblack, the heat will be prevented from reaching the hand in some measure. If the bottom is clean, it will feel hot. 2. How are lenses adjusted in instantaneous photograph cameras to focus themselves correctly at different distances? A. The lens is so constructed as to keep the emergent rays as nearly parallel as possible, so that the approximate focus is what is known as a deep one.

(535) H. B.—Condensation of natural gas to a liquid is impracticable on the large scale, and cannot be accomplished on the small scale without extreme reduction of temperature. Aluminum steel is ductile if properly annealed. Experiments with aluminum alloys for ordnance have yet to be made. The U. S. government has in contemplation experiments with submarine boats.

(536) S. H. M. writes: Please be kind enough to explain the following phenomena of the water hammer: 1. When friction is applied to the tube, the bulb at the upper end being full of water, all but a bubble, a sort of boiling takes place through the contracted tube immediately below the bulb? A singing noise accompanies it. 2. When the thumb is applied to the lower end of the tube where there is a slight bulge, the tube being inclined just sufficiently to allow a small bubble to remain in the bulge, the instrument seems to serve as an accurate pulse glass, and indicates the pulse beats. A. Both phenomena are du to heat produced by friction or contact. The pulse indication is, we believe, quite imaginary, and if the bubbling agrees with the pulse-beat, it is a coincidence only.

(537) M. K. writes: Considerable annoyance is caused in our bleaching works by the soda imparting to the materials to be bleached a reddish tinge, which is very positive in its resistance to the bleaching agent—chloride of lime solution. Will you please say if there is anything in the soda that would be likely to produce this result, and if there is anything that will neutralize it? A. We presume the trouble is due to the presence of iron. Treatment of the goods with a weak acid bath might remedy it.

☞ Books or other publications referred to above can, in most cases, be promptly obtained through the SCIENTIFIC AMERICAN office, Munn & Co., 361 Broadway, New York.

INDEX OF INVENTIONS

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March 5, 1889,

AND EACH BEARING THAT DATE.

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

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Car driving mechanism, street, J. McLean 399,152
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Car ventilator, automatic, W. G. Creamer 398,882
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Cart, road, E. R. Lawrence 399,056
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Cash and parcel carrier, Clark & Crossley 399,018
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Cash indicator and register, Schickner & Marty 398,979
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Dental tooth regulating screw, E. H. Angle 399,177
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Distilling petroleum, G. H. Perkins 399,073
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