

## RECENTLY PATENTED INVENTIONS.

## Engineering.

**TRACTION ENGINE DRIVING GEAR.**—Thomas C. Robinson, Jr., Ipava, Ill. This gear is strongly made and simple in arrangement, to facilitate running the engine with more power and less speed over rough roads and up hills, and with increased speed over smooth and easy roads. Combined with guideways on the shell of the boiler, and fixed driving and drivegears, is an adjustable slide between the gears, on which are journaled a single gear wheel and a double gear wheel to be readily engaged with or disengaged from the fixed gears. The cog wheels are designed to be so proportioned as to give any desired fast and slow speed.

**TURN TABLE.**—Gabriel Rohrbach, Del Rio, Texas. In turn tables for turning locomotives, this invention provides a simple lever attachment by which one man may easily turn the table and its load, the lever mechanism being easily locked in place when not in use, and not being likely to get out of order. Upon a revoluble bed carrying a circular track is mounted a bracket in which a vertical oscillating shaft is turned by a lever, a catch plate oscillating on the rail having vertical teeth to engage the rail, and there being a crank connection between the catch plate and the shaft and a lever mechanism for shifting the angle of the catch plate.

## Mechanical.

**DRILLING MACHINE.**—Louis Reichert, Scranton, Pa. This machine has two aligned rotatable and sliding spindles carrying drills adapted to slide and rotate, while a series of independent spring leaves act on the outer ends of the spindles, the leaves being reinforced one by another to gradually increase the pressure on the drill. The machine is designed chiefly for boring eye-glasses, and provides for but a slight pressure on the spindles at the beginning of the boring, to avoid chipping the glass, the pressure being afterward graduated as desired.

**FELLY PLANER.**—William R. Dunn, Alton, Ind. In a suitable frame are slides adapted to move up and down, felly-supporting beds being hung on shafts in the upper and lower ends of the slides, each supporting bed having a segmental holder for supporting the felly to move it in contact with a revoluble cutter head journaled in stationary bearings, friction rollers pressing the fellys in place on the holders during the time the cutter heads are cutting. The planer is of simple and durable construction and designed to correctly and uniformly plane the inner and outer faces of the felly to the desired diameter.

**CRUSHING AND GRINDING ASPHALT ROCK.**—John H. Tabler, Russellville, Ky. In this machine a revolving feed drum is mounted over a heating chamber, the material fed into one end of the drum being heated as it passes through and is discharged into crushing and grinding rolls with different contact faces of different diameters, differentially spaced apart and journaled to rotate at different speeds, whereby the continuously fed material is successively crushed into small particles. Steam and hot water are mixed with the material as it is being crushed to prevent clogging or adhering to the rolls.

## Railway Appliances.

**NUT LOCK FOR RAILS.**—Jefferson D. Tynes, Fort Smith, Ark. This improvement comprises a base plate having apertured washer-like ends adapted to fit over the bolts, a spring metal key bar being fixedly held at its center on the base plate, with its opposite ends held for a free twist movement and projected beyond the face of the washer portions of the base plate. The device is a double lock nut, especially designed to lock nuts against the fish plates of rail joints.

## Miscellaneous.

**PROCESS OF MANUFACTURING GAS.**—Gustaf M. Westman, Hackettstown, N. J. A furnace of special construction is provided by the inventor for carrying into effect this process, which consists in passing a mixture of gases through iron oxide in a reducing furnace to produce iron sponge, the mixture consisting partly of new formed gases and partly of gases previously passed through the iron oxide and afterward heated and carburated, then passing steam through the iron sponge to reconvert it into iron oxide and produce hydrogen, and passing the latter through glowing coke to take up and combine with its carbon.

**STORE SERVICE CARRIER.**—James R. Pollock, Mansfield, Ohio. This invention provides a simple, economical and easily operated apparatus, so arranged as to conveniently brake the car on its return to the stations, to avoid unnecessary noise. The apparatus has a grade track formed with inclines and supported upon depending hangers, and combined with the track and a propelling line for moving the car is a cylinder in which is fitted an air-tight plunger, there being connections between the plunger and the propelling line whereby the plunger will retard or brake the return of the car, and, by the vacuum produced beneath it, aid in actuating the propelling line to drive the carriage.

**ADJUSTING DEVICE FOR BICYCLES.**—John H. Prince, Carroll, Montana. This device is to facilitate tightening the driving chain and to hold the spindle of the driven wheel always in parallel position, relative to the pedal or crank shaft, so as to cause the wheel to run true. It consists of a frame having in its forked ends racks meshing with gear wheels secured on a spindle turning on bushings sliding in the forked ends of the frame, a screw screwing in the frame engaging one of the bushings, and there being nuts screwing on the ends of the spindle and abutting on flanges formed on the bushings.

**CHECK BOOK.**—Isaac B. Alter, Rossville, Kansas. This invention consists of a casing having a pocket and a check tab adapted to be fastened to the inside of the pocket, the arrangement being such as to permit of conveniently removing the checks and of re-

placing the check tab when used up without requiring an entirely new book. The check tab carrier is connected to the casing within the pocket, to slide in and out, and is formed of a plate having a slide and points or hooks for engagement with the tab.

**FIRE ESCAPE.**—C. P. Elieson, New York City, and Francis A. Pellas, Greytown, N. Y. According to this improvement swinging ladders are adapted to be dropped from various balconies to form a passageway from the windows of a building to the ground, means being provided for automatically opening the balcony doors by the movement of the ladders, the doors and ladders being so geared that one acts as a counter-balance for the other. A whole vertical series of ladders may be quickly released and dropped together. A building provided with this improvement will ordinarily appear to have only the usual balconies under the windows.

**FIRE ESCAPE OR LIFTER.**—William Wellens, Oldham, England. This is a simple and inexpensive apparatus by which weights or loads may be easily transferred from one floor to another, while also affording a fire escape, and a device for use as an ordinary ladder, to facilitate the painting and repair of buildings. As a fire escape, it has upper and lower shafts journaled in brackets to support drums carrying an endless belt ladder in front of a building opposite the windows, the ladder moving, under control of a brake, to convey to the ground persons stepping on it. When used to support workmen the ladder is locked in fixed position, and one form of the apparatus provides for its use on a portable frame adapted for lifting.

**AWNING.**—Catherine Leclercq, Lima, Peru. This awning is constructed on the principle of Venetian blinds, and is adapted to be folded in a box fastened over the door or window on which the awning is to be applied. The invention consists of a head mounted to turn and connected by tapes with the slats, supporting rods connecting with either side of the outermost slat so as to hold the slats in a ventilating, sheltering position, or in a closed position during rainy weather.

**METALLIC SHELF.**—Charles W. Marquardt, Detroit, Mich. This shelf consists of tubular brackets engaged by tubular braces, connecting plates secured to the brackets and braces, and a shelf plate secured to the brackets and resting on the braces, the entire device being cheaply manufactured and conveniently assembled, and designed to be very ornamental in appearance, for use as a metallic mantel, bracket shelf, table top, etc.

**PACKING CASE.**—David F. Griffiths, New York City. After the parts of this case have been nailed or screwed together they cannot be separated without showing that the parts have been tampered with, but the nails or screws are entirely concealed by parts which act as braces or ties. The case has a continuous dovetail or under-cut groove surrounding it at each end, through which the nails or screws are driven, and through which a tie or strap is afterward passed and its ends sealed. When the straps have been carefully removed in opening the case, the case may be again used for packing.

**HANGING OR SWINGING CHAIR.**—Samuel F. Purington, Brunswick, Me. This chair has forked lower extremities removably connected with a platform support, and the arms are removably connected with swinging supports and with the back of the chair, the arms having a pivotally connected link at one end and an angle iron at the opposite end, the link and angle iron having slots receiving studs on the swingingsupports and on the chair body. These chairs may be quickly and easily connected with their supports, and disconnected, to be folded compactly for shipment.

**FASTENING SLIP COVERS ON FURNITURE.**—Henry Seher, New York City. This inventor provides a device whereby the covers may be firmly and smoothly held on the furniture, especially on the seat, preventing an untidy appearance. The improvement consists of spring fasteners held on a rod, the fastening devices being located along the edge of the seat, back, or other part, and where the cushions of two such parts meet the spring fasteners are adapted to be forced, with the slip cover, into the crease between the cushions.

**COMBINATION FOLDING BED.**—Edward E. Murphy, Madison, Wis. The legs of this bed are automatically unfolded when the bed is lowered and locked when the bed is down. The casing is finished off in the style of a wardrobe, with cabinets on each side of the casing, one intended for bedroom articles and the other fitted up as a writing desk or secretary. Means are provided for tightening the mattress spring and for holding the bed clothes when the bed is folded up. The invention affords a cheap, simple, and safe folding bed, with few operating parts, and one in which the balancing weights are dispensed with.

**UMBRELLA CANE.**—Rufus Waples, Jr., New York City. This is an improvement on a former patented invention of the same inventor, providing for bracing the inner ends of each of the ribs against the opposite rib or ribs by a pivotal attachment which will permit of freely closing and opening. A metal strap plate, ring or flange, may also be durably attached to the ends of the ribs to greatly increase the strength without adding sensibly to the bulk, making possible also much more rapid manufacture. When the cane is used as a walking stick its canopy is entirely concealed.

**HAIR CURLER.**—Sylvester K. Mathews, Albany, N. Y. This is a device designed to be manipulated with one hand, and cause the hair into which it is introduced to curl or wrap around it as the curling section is manipulated, the hair so encircling the curling section that the section may be withdrawn from the hair and the latter will remain in curl. The curling section consists of a cage in which are longitudinal parallel spaced rods.

**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.

**MODERN AMERICAN PISTOLS AND REVOLVERS.** By A. C. Gould. ("Ralph Greenwood.") Boston: Bradlee Whidden. 1894. Pp. iv, 222. Illustrated. Price \$1.50.

This most interesting book treats of modern pistols of the single shot type, such as the Stevens rifle, the Remington, Derringer and others, interesting either historically or practically, of revolvers of the most modern type, of target and pocket revolvers, and gives not only their points of construction, but treats in considerable detail of relative accuracy of different weapons. In addition to illustrations of the same and of targets produced by them, numerous portraits of celebrated marksmen, many of them in shooting attitude, are interspersed through the volume.

**ELEMENTARY LESSONS IN STEAM MACHINERY AND THE MARINE STEAM ENGINE.** By Staff Engineer J. Langmaid and Engineer H. Gaisford. London and New York: Macmillan & Co. 1893. Pp. xv, 267. Price \$2.

This work is prepared for naval cadets on the English ship Britannia, and the syllabus of subjects dealt with is based on the plan of the London University. The work is very attractive and general in the treatment of its subject, and is really a work rather for reading than for hard study. Quite a striking feature is found in one of the cuts, Fig. 84, which represents the section of a steam cylinder and D valve, the valve and piston both being movable, so as to make the cut in some sense a working model.

**DYNAMO AND MOTOR BUILDING FOR AMATEURS, WITH WORKING DRAWINGS.** By C. D. Parkhurst. New York: The W. J. Johnston Company, Ltd. 1893. Pp. vi, 163. Price \$1.

Lieut. Parkhurst has a name familiar to our readers from his articles on electrical apparatus which have been published in our SUPPLEMENT. This book will, we doubt not, be welcomed by many constructing amateurs, who are interested in motors and dynamos.

## SCIENTIFIC AMERICAN BUILDING EDITION.

APRIL, 1894.—(No. 102.)

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1. Elegant plate in colors showing a handsome colonial residence just completed at Ashbourne, Pa., for Charles Salmon, Esq. Two perspective views and floor plans. Cost complete \$11,500. Frank R. Watson, Esq., Philadelphia, Pa., architect. An elegant design.
  2. Plate in colors of a Chicago dwelling designed for an architect's home, and recently completed at Morgan Park, Chicago, Ill. Two perspective views and floor plans. Cost \$4,300 complete. Mr. H. H. Waterman, architect, Chicago, Ill.
  3. Two perspective views, interior view and floor plans of the elegant residence of Judge Horace Russell recently completed at Southampton, Long Island. Mr. Bruce Price, New York City, architect. An admirable design in the colonial style of architecture.
  4. An English cottage at Buena Park, Chicago, Ill. Two perspective views and floor plans. Mr. James Gamble Rogers, Chicago, Ill., architect. A unique design in the Gothic style of architecture.
  5. A residence at Southport, Conn. Two perspective views and floor plans. A picturesque design in the modern colonial style of architecture. Mr. W. W. Kent, New York City, architect.
  6. A cottage at Freeport, Long Island, erected at a cost of \$2,600 complete. Perspective view and floor plan. A unique design. Mr. W. Raynor, Freeport, L. I., architect.
  7. A residence at Rogers Park, Ill. Two perspective views and floor plans. Cost \$3,948 complete. An attractive design. Mr. C. W. Melin, Chicago, Ill., architect.
  8. Two perspective views and floor plans of a dwelling recently erected at Rogers Park, Ill., at a cost of \$3,730 complete. A unique design. Mr. Robert Rae, Jr., Chicago, Ill., architect.
  9. A cottage at Morgan Park, Ill., erected at a cost of \$2,968 complete. Two perspective views and floor plans. An attractive design, treated in the English cottage style of architecture. Mr. H. H. Waterman, Chicago, Ill., architect.
  10. The new St. James M. E. Church at Kingston, N. Y. Perspective and plans. Architects, Messrs. Weary & Kramer, of New York City and Akron, Ohio. Estimated cost, \$70,000. Style of architecture, Romanesque.
  11. Miscellaneous Contents: Vibrations of tall buildings.—Artificial stone.—A simple and efficient dumb-waiter, illustrated.—An improved woodworking machine, illustrated.—The New Era electrical gas burner, illustrated.—P. & B. Ruberoid roofing, sheathing papers, and paints.—Improved wood-working machine, illustrated.—Foot power mortising machine, illustrated.—A large sheet metal ceiling, illustrated.
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## Notes &amp; 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.

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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.

(5939) J. M. H. asks: 1. How are carbon plates made? A. See query 5942. 2. Please tell me how many gravity cells it will take to charge a storage cell about the size of a two quart jar, and how long will it take? A. Allow three gravity cells, and one or two days.

(5940) H. A. M. writes: 1. We have a maple sugar camp and use three old-fashioned pans, 26 inches wide and 12 feet long. Would they evaporate more by having them partly covered? A. The pans should not be covered, but will evaporate faster by continual stirring with a rake. A hay rake makes a good stirring implement. 2. Can I put under one of them a coil of 1¼ inch gas pipe to heat the sap before it reaches the pans? How many feet of pipe would be required to heat 1,500 gallons in about 15 hours, sap to be taken from a tank by the side of the pan? (Good dry wood used.) A. We do not recommend the coil under the pan. It interferes with the proper management of the heat of the pan and is not easily cleaned. A supplementary pan placed at the rear, a little higher, so as to draw into the sugar pan, is preferred. It can be heated by extending the flue and chimney. 3. What is the best way to cleanse maple sirup? A. The white of eggs frothed by beating with a little of sirup, stirring thoroughly in the sugar pan, and skimming off the scum is the usual process for clarifying maple sugar. Milk is also used. Much stirring whitens the sugar while granulating. 4. The Odd Fellows here have a two-story hall, and they cannot rent the ground floor on account of the plainness with which they can hear below what is going on upstairs. Can it be deadened in any way? The building is a two-story frame, sealed with inch lumber, and the upper floor is double, with a 2 inch strip between them. A. A thick paper felt, or strawboard, laid on the floor and another floor laid on the strawboard, or below ceiling, with a thin second ceiling, with strawboard or felt between; or, what would be better, furoff the ceiling, and lath and plaster; this will deaden the sound from above.

(5941) C. N., Vienna, Austria, asks: 1. What should be the proper size and pitch of a propeller wheel for a steam yacht to attain greatest speed possible, fitted with a compound engine of 60 indicated horse power, making 300 revolutions per minute? A. The size of propeller suitable for your engine and its proposed

speed should be about 6 feet, more or less, to suit the model and allowed draught of the vessel. The pitch should also vary with the lines of the boat, longer for a sharp, fine-lined boat than for a boat of burden or a tugboat.

(5942) E. P. says: Will you kindly tell me how the carbon for arc lights is made and what is the material used? A. Clean pieces of coke are selected, pulverized, and passed through a fine sieve.

(5943) J. T. T. asks: 1. For formula for making sealing compound suitable for dry batteries. A. Use resin 4 parts, gutta percha 1 part, melted together with a little boiled oil.

(5944) H. M. writes: In mounting condensers for magic lanterns, how close should they be placed together? A. Place them, if double, with convex sides inward and generally not more than a quarter of an inch apart.

(5945) J. C. M. asks for the best method of tempering the steel for the magnets used in the Bell telephone. A. Heat to a cherry red the ends only of the steel bars, plunge them in water to harden them, and draw the temper to a dark straw color or bronze bordering on purple.

(5946) R. F. W. asks: 1. In making dynamo described in SUPPLEMENT, No. 600, will not brass do just as well as bronze for the yokes? A. Brass will answer the purpose, but not as well as bronze.

(5947) G. W. asks: 1. Can I obtain a sufficient spark to ignite the gaseous mixture in an oil engine by winding copper wire around a soft iron core? A. Yes. 2. If so, what size core and length of wire will be required?

(5948) S. L. P. asks how dents are taken out of cornets and other brass horns. A. If the dents are inaccessible, so that tools cannot be applied to them on the inside of the horn, you can take them out after a fashion by soldering to the deepest part of the dent a wire and drawing the metal out, afterward unsoldering the wire and cleaning the surface of the brass.

(5949) J. asks whether fish oil is injurious to rubber goods. Also what effect it would have when applied to rubber hose? A. Fish oil has a deteriorating effect on rubber. It tends to soften hose.

(5950) F. H. W. asks for a formula for a quick dry plate hardener, or something he can put on the plate that will dry rapidly by heat (without causing the film to run), in order to get a print shortly after development. A. The following is said to be a good gelatine hardener: The negative, after fixing and washing in the usual manner, is treated with a hardening solution composed of chloride of aluminum 5 to 12 grains, water 1 ounce.

(5951) W. C. S. writes: 1. In the SCIENTIFIC AMERICAN for February 24, 1894, is given a description of a magneto call bell for telephones. Could I make a cheaper call? A magneto bell is rather expensive. A. On page 162, current volume of SCIENTIFIC AMERICAN, under the head of "Telephone Experiments," you will find a description of a simple telephone call, which is effective for quiet places. 2. Will you give me a receipt for a stove polish? A. Mix 5 parts, by weight, of black lead (plumbago), 5 parts of boneblack, 10 parts of iron sulphate. Mix thoroughly and make into a paste with water.

(5952) Nick wants to make a sign having the letters smooth and clear, the balance of ground to be chipped or torn off and left rough. No particular pattern. A. Clean the glass thoroughly, then apply a solution of good glue or of gelatine to the portions to be chipped. On drying, the glue or gelatine will contract and chip the glass.

(5953) Y. M. C. A. says: Would you kindly inform me, through your answer department of SCIENTIFIC AMERICAN, how to resilver a mirror? A. See page 183 of the issue of the SCIENTIFIC AMERICAN for March 24, 1894.

(5954) J. R. S. asks: 1. What is the receipt for making laundry starch and mode of using same so as to produce a gloss when applied with a hand iron, such as used in families doing their own washing and ironing? A. One ounce each of gum arabic and borax are dissolved in 10 ounces of water; 1 ounce each of white wax and spermaceti are melted, and while liquid are rubbed with the solution of borax and 10 drops oil of cloves to make emulsion, mixing them thoroughly. A teaspoonful of this mixture in a pint of starch gives a fine polish. It may also be applied after starching by rubbing over the starch with a cloth and then polishing with the iron. The starch mentioned above is the ordinary dry starch made into a paste with hot water. 2. What is a formula for making black ink? A. Black Ink.—Gallnuts, coarsely powdered, 75 parts; sulphate of iron, 4 1/2 parts; over this pour 2,000 parts of cold water. Digest for twenty-four to forty-eight hours. Strain through a cloth and add 24 parts gum arabic.

(5955) C. W. H. writes: I am going to lay 1,800 feet of piping to carry water from a pond to a well. The fall is about 10 feet in the 1,800, with about a 6 foot head, one turn at right angles. What I want to know is this—Which would convey the most water under above conditions—one pipe 4 inches in diameter the entire distance or begin with a 6 inch pipe 600 feet, then 4 inch pipe 600 feet, and then 3 inch pipe the remainder of the distance? Also, about how much water would flow through each of the above systems in 24 hours? A. With a continuous 4 inch pipe you will have a flow of 144,000 gallons per day of 24 hours. With sections of 6 inch, 4 inch, and 3 inch pipe in equal parts, you will have a flow of 129,000 gallons per day. If 1,200 feet of 4 inch, with 600 feet of 6 inch pipe at the pond end, you will have a flow of 180,000 gallons per day.

(5956) P. W. C. says: What is the formula for the combined toning and fixing solution for solio photographic prints, a solution which does not need mixing for use, but is always ready? A.

No. 1. Sodium hyposulphite..... 10 ounces. Alum potash..... 2 1/2 ounces. Potassium sulphate..... 1 ounce. Sodium sulphate..... 5 ounces. Water (distilled)..... 80 fluid ounces. Dissolve the hypo and the alum in the water; then add the sodium and potassium sulphate; allow it to stand for two or three hours.

No. 2. Gold chloride..... 15 grains. Lead acetate..... 6 grains. Water (distilled)..... 8 ounces. Mix in the proportion of 8 ounces of No. 1 to 1 ounce of No. 2. The mixture is stable and the bath is always ready for use.

(5957) P. O. M. writes: I have a piece of common window glass; by breathing on one side of same the outline of a person is produced as though it was drawn on with milk; but it evaporates with the dampness leaving the glass, and it is not visible again unless the glass is again moistened with the breath. A. The glass to which you refer has been slightly etched with hydrofluoric acid. The etching does not show when the glass is perfectly dry, but moisture develops the image, which disappears as soon as the glass becomes dry.

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INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

April 3, 1894.

AND EACH BEARING THAT DATE.

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

Table listing inventions such as Accordion, J. Galleazzi, 517,648; Air compressor, hydraulic, Schuts & Henderson, 517,628; Alarm, See Burglar alarm, 517,777.

Table listing inventions such as Bed springs, device for tightening woven wire, E. M. Easting, 517,818; Bedstead, G. E. Proctor, 517,482; Berth, ship's, E. Lawson, 517,462.

Table listing inventions such as Gymnastic appliance for school desks, T. Beasing, 517,768; Hammock, T. B. Thomas, 517,667; Hanger, See Shade hanger, 517,723; Harrow, disks, machine for sharpening, J. L., 517,810.