RECENTLY PATENTED INVENTIONS.

Engineering.

HYDRAULIC EXCAVATOR. — Adoniram Fairchild, New York City (deceased, Benjamin D. Fairchild administrator). This is an improvement upon a formerly patented invention of the same inventor of a device for the removal of sand, mud, and gravel from a water bed, and provides for a construction to permit the outer shell of the excavator to be extended down to form an annular chamber between the shell and lift pipe, water being forced from the exterior to enter this space, carrying into the lower end of the lift pipe excavated material loosened by water jets within the annular chamber. The entire device is swung by chains or ropes from a laterally movable support above the water surface.

BOILER.—Frank Saxon, Worthington, Minn. Return flue boilers for road or traction engines are provided by this invention with a front extension to save the flame sheet and that portion of the flue sheet above the water line. The extension is hinged to the main portion of the boiler, so that its interior may be easily examined, the hinges forming the supply and discharge pipes, and the extension supplies hot water to the interior of the main boiler. By the improvement a greater amount of heating surface is obtained, with a consequent increased economy of fuel.

Railway Appliances.

CAR BRAKE.—Howard B. Hanmore, St. Paul, and Thomas N. McLean, Fergus Falls, Minn. Brake levers on the brake beams are, according to this invention, connected together, and springs under the car body are connected by a link with one brake lever, while a sink connects the other brake lever with a fixed support, and operating levers are connected with the springs. The construction is such that the operator cannot increase the power more than the coefficient between the load and the rail, thus preventing the wheels from sliding, lessening the friction, and the liability to the destruction of the wheels.

CAR TRUCK.—Gustavus L. Stuebner, Long Island City, N. Y. This is an improvement upon car trucks having pilot wheels to keep the trucks on the track in passing swiftly around short curves. Guide wheels of less diameter than the supporting wheels are carried by the advance axle and adapted to engage the inner surfaces of the rails, while the trucks are pivotally connected with the car by attaching the body of the car to the bolster of a truck, enabling the truck to accommodate itself to very sharp and quick turns. The guide wheels are virtually small pilot wheels held on a shaft journaled in arms projected from the bolster.

CABLE GRIP.—Henry A. Shipp, Atwater, Cal. By this device it is designed that the operator shall be able to graduate the grip on the cable according to the load to be pulled. A slide is movably held in a grip frame on which is pivoted a lever actuated from the slide, jaws on the lever on opposite sides of its fulcrum engaging the cable. By means of mechanism convenient to the operator, the slide may be moved so that the jaws will take a more or less heavy grip upon the cable.

Mechanical.

POLYHEDRAL LATHE. — Manuel Rul, City of Mexico, Mexico. This lathe has a cutter shaft and swinging supporting arms, against one of which bears a tension device, in combination with cutter clamping and guiding arms movable along the tool shaft, and other novel features, whereby work may be quickly performed and prisms of any character be turned, and whereby also a number of articles may be placed in the lathe and presented consecutively to the turning or cutting tools. At one revolution of the chucks it is possible to turn one face of all the articles carried by the chucks, the articles being then reversed to offer another face, and the operation being repeated until all the predetermined faces have been made.

MOULDING PROPELLERS.—Louis His, New York City. To obviate the necessity of using patterns in casting propeller blades for vessels is the design of this invention, which provides a flask with side pieces of dissimilar height having rows of perforations, a perforated machined end piece connecting their outer portions, while an adjustable bottom has fastening bolts to enter the perforations in the sides and end of the flask. By this means propellers may be moulded with great accuracy and facility, two flasks being employed for the opposite sides of the propeller blades, the spindle and flasks being arranged upon a perfectly smooth and substantial bed, and the pouring being done in the usual way.

Agricultural.

PLOW.—Ramon G. Rivero, Monterey, Mexico. This is a double mouldboard plow, designed to cut the earth uniformly, run comparatively easy, and completely turn the furrow in all cases. It has a flat, straight-edged point, preferably made separate from an angular share having horizontal lateral wings, and the rear edge of the share is riveted to the mouldboards. The plow is very light, yet strong.

LAND ROLLER AND HARROW.—Carl Storla, Belford, South Dakota. The forward portion of this implement consists of a harrow for breaking or pulverizing lumps of earth, and behind the harrow are front and rear rollers arranged to cover every portion of the ground and prevent the formation of ribs. Each of the rollers is provided with an efficient scraper and a lubricating device, and the machine has markers to indicate to the driver the line along which the center of the implement must move to thoroughly cover the ground.

Miscellaneous.

PLACER MINING APPARATUS.—Marshal D. Platner, Elliston, Montana. This apparatus has an upper sluiceway with a perforated floor, below which is a lower sluiceway, into which delivers a mercury tank, there being riffle plates in the lower sluiceway below the tank, and a concentrating device receiving the discharge, while a pump forces the amalgam from the concentrating device back to the mercury tank. The invention also covers other novel features, the apparatus being designed to rapidly make a clean separation of sand and gold, and also to facilitate the separation of precious stones, where they occur in the diggings.

WATER WHEEL AND ELEVATOR. — John B. Lockwood, Helmville, Montana. This is a device supported to have its paddles dip in the surface of and be revolved by a stream, while it at the same time elevates and discharges water for irrigating or other purposes. A cylinder secured to a shaft has end flanges, beyond which the paddles project, while buckets are formed between the paddles, and guide strips aligning with inner edges of the flanges guide the water raised by the buckets to a sluice for delivery at any desired point.

BIOPTOSCOPE. — Charles H. Meddins, Omaha, Neb. This is a simple apparatus to show moving objects in a succession of fixed positions. It consists of a frame with apertures on opposite sides of its center, a handle and mouthpiece, and to the frame is pivoted a disk with other corresponding apertures, and having inclined vanes or wings. It is designed mainly as a toy, but may be used to observe the movements of animals and birds, and also for inspecting rapidly moving parts of machinery.

STOP WATCH.—Adolphe G. Guerin, Savannah, Ga. The second hand of this watch may be stopped through the stem-winding mechanism without stopping the minute and hour hand or interfering with the movement of the watch, facilitating the readjustment of the second hand in relation to the minute and hour hand, and also adapting the watch for use for racing purposes. The improvement consists in a special mechanism connecting the second hand to the stem-winding and setting devices.

WIRE STRETCHER AND REEL.—Edgar S. Hoge, Morris, Ill. This is a machine to be drawn along by a horse and adapted to reel up or pay out wire, stretching the wire as it leaves the reel. The reel is one side of a frame which may be rotated in either direction and be locked, as required, the reel being supported on a crank-handled shaft, and a ratchet being connected with the shaft. A novel wire-guiding mechanism and a simple brake device form features of the invention.

TREATING SEWAGE.—James J. Powers, Brooklyn, N. Y. A process of chemically treating and purifying sewage before its discharge has been provided by this inventor, the sewage being moved forward through suitable conduits, at the head of which are introduced disinfectants and substances forming with the sewage compounds insoluble in water, the floating and sedimentary matter being removed, and the entire body of sewage simultaneously treated with a disinfectant or germ-destroying gas. The water separated out is finally treated with liquid disinfectants.

LAND ROLLER.—Eli W. Farr, Cedar Springs, Mich. This machine has a front and rear section, and comprises a series of rolls independently mounted upon a frame, the rolls being capable of vertical movement at their ends, or being adapted to be so fastened to the frame that they will be held straight. The machine will work upon even as upon uneven ground, and when not in use the sections may be uncoupled and the machine stored in small space.

SLEIGH.—Willie N. Snow, Snowville, N. H. This invention provides an improvement in the running gear of side bar spring sleighs, by means of which such gear may be cheaply made and very strong. The invention covers certain features of construction and combinations of parts.

THILL COUPLING.—William H. Tydeman, Walsenburg, Col. When the shaft iron of this device is in draft position it cannot be disconnected from the coupling, but such separation is readily effected when the shaft iron is carried up to an angle of forty-five degrees. The coupling is practically automatic, as no wrenches or other tools are required in its manipulation, and an elastic block held against the clip section renders it anti-rattling.

FLOWER POT AND STAND.—Alfred A. Holt, Brooklyn, and Jacob P. Kooy, New York, N. Y. A very ornamental stand is made to serve as a casing for a flower pot, while it has a lower chamber forming a readily removable water receptacle. The pot fits into the stand so that its bottom rests in the water in the receptacle, and should water overflow from the top of the pot, it will be received and held in the receptacle or the casing.

BOOK BINDING AND BOOK.—Johann G. Bast, Brooklyn, N. Y. This binding comprises a series of sections with a rod on the back of each, binding strips extending across the rods on the outside and a binding cord uniting the leaves of each section, fastening the rod to its section and the binding strip to the rods, while also flexibly connecting the several sections of the book with each other. This binding combines strength with durability, and the leaves lie perfectly flat when the book is opened.

MUSIC BOOK OR FOLIO.—William H. Ayres, Sackett's Harbor, N. Y. This invention relates to books or folios adapted to be supported on portable music racks, affording a cheap and strong book, with means for fastening the leaves so that none will be hidden. Any number of sheets or leaves may be quickly and strongly fastened in place, rings serving as a means of attachment or hinges for the sheets of music, held between covers in the usual way.

EGG POACHER.—Clara T. Gott, Seattle, Washington. Upon a perforated plate having a central vertical handle is fixed a series of disconnected rings, hinged to the plate, so that any of the rings may be swung up to remove an egg without releasing the contents of the other rings. To cook the eggs, each one is dropped into a separate ring and the poacher is placed in a pot or basin containing boiling water.

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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.

(4967) E. B. asks: 1. Are cast iron pole pieces any better than wrought iron for dynamos? A. Cast iron pole pieces are preferred to soft wrought iron, on account of their ability to retain sufficient magnetism to start the machine. 2. About how long would a storage battery (such as is described in a late number of the SCIENTIFIC AMERICAN) hold its charge if the plates were 2 inches by 5 inches? A. The storage battery might hold the most of its charge for three or four weeks, but it will begin to run down immediately after charging.

(4968) J. C. B. writes: Would it be practical and would it be a successful drive to run a paper friction on a crown face wheel? I have a fly wheel on an engine shaft ten feet diameter, twenty-four inch face. This wheel has three-sixteenths of an inch crown. Now I want to put an eighteen inch paper friction on this wheel to run a dynamo. The question is, Will it be a successful drive or will there be too great a loss of power, owing to the fact that the friction wheel is running on a crown face? In other words, What would be the true action of the friction on the crown face wheel? Can you give me any rule for calculating the power transmitted by paper friction? A. The running of a friction wheel on a fly wheel of the width and diameter named will make but little friction, from the small curvature of three-sixteenths of an inch in 2 feet in width. If the driven wheel is covered with thick sole leather, so that it will be slightly elastic on the surface, it will take better to the crown and give a better working power. The transmitting power of good friction gear is fully equal to belting with the same pressure on the pulleys as the tension on belts. See Cooper's work on "The Use of Belting and Friction Gear," $3.50 mailed.

(4969) W. F. B. asks: What proportions of gasoline vapor and air are necessary to run an engine? A. 25 to 35 volumes. 2. How many pounds per square inch should it be compressed before it will ignite? A. No compression is needed.

(4970) W. C. V. N. writes: Suppose that a drum on a hoisting engine is held by a friction clutch so that it just raises a weight of one ton, one hundred feet a minute. Theoretically would that clutch slip if the engine were driven so that the weight would rise two hundred feet per minute, all other things being the same, only the increase of speed? A. Increased speed in hoisting means increased power. The friction clutch set for a given hoisting speed will slip if the speed of the engine is largely increased or doubled.

(4971) R. M. writes: We desire to use a wire belt to run over a smooth surface and would like to get it down as low as No. 12 wire. We shall run six or eight belts in number, side by side, but all of them entirely separate and distinct, but over the same pulleys. Could you give us an idea of what is the best wire to use and whether to use a very fine quality of steel or soft wire? The size of the pulleys will be 12 inches for the smaller one and the other will be larger. A. The ordinary unannealed steel wire is the best for your purpose. Pulleys should be grooved to fit the wires. You would get better service if the small pulley were larger, say 16 inches, as the constant running of a No. 12 wire over a 12 inch pulley tends to crystallize and weaken the steel wire.

(4972) F. J. H. asks: How can I make a cheap sand pump for pumping quicksand out of well 32 feet deep? A. You can make a cheap sand pump with a piece of stove pipe or a strong tin can. Put a bottom in one end of a length of stove pipe, with a lip like an auger bit, and fasten the other end to a pole, so that by turning it around in the quicksand a charge can be drawn into the pipe and lifted out. The same can be done with a tin can, by cutting a slot in the bottom from the center to the edge and pressing down one edge into a lip. Fasten to a pole, as with the piece of stove pipe.

(4973) C. & T. write: Will you please tell us what is meant by gold filling; for instance, gold-filled watch cases? What is the process? A. Filled gold work is made by backing good gold, 16 to 18 carat fine, with silver or other solder as a filling for stiffening or to make up weight. For watch cases, where the inside also shows gold, the base metal is plated on both sides, while in a thick slab, with good gold plate, by soldering with silver or other hard solder. The whole is then rolled down to the proper thickness for making the cases. Rims, rings, and knobs are made by drawing gold tubing over brass or silver wire and soldering with hard solder, when the rims can be drawn down to the proper shape. Knobs are struck up by drop presses in thin solid gold plate and filled with silver solder.

(4974) J. L. C. writes: I can find no way in which to make solder stick to my soldering iron, as this is necessary to make neat work. I write to see whether you can furnish me with an effectual recipe. A. It is necessary to tin the soldering copper with pure tin, not solder. Rub the hot copper on a piece of sandstone or a brick to brighten the surface, and at the same time sprinkle some powdered sal ammoniac on the brick and apply a stick of tin to the copper, rubbing the point on the stone or brick in contact with the sal ammoniac and tin.

(4975) H. D. M.—The reason why you did not succeed in your experiments was clearly because you did not follow the instructions. We do not think you ought to expect to have a mixture of sulphur and plumbago act the same toward gases as the carbon would; neither can you expect the artificial carbon to take the place of charcoal. We have no doubt if you closely imitate Jablochkoff's experiments you will succeed as well as he did.

(4976) A. M. M. asks how an electric motor exerts force—by attraction of armature or by repulsion of armature, or by both? Also, why is it that electric motors cannot be made of more than say 80 horse power? What is it that imposes so low a limit? A. The force of an electric motor is mainly that of attraction, although repulsion plays a small part in its operation. We know of no reason why electric motors cannot be made of greater power than 80 horse power.

(4977) A. M. P. asks: Can aluminum be put on plates like those used for tin, or dipped like tin plates? With the same thickness of coat, will they cost any more? (If manufactured, name firm.) Can the material be used for keeping fruit in? Can tin and aluminum be mixed and used to plate iron? A. Aluminum melts at a full red heat, and is not a suitable metal to coat other metals with as tin is used. The electric plating is not very much used. Tinning iron plate with an alloy of tin, with 3 per cent of aluminum, makes the tinned surface a little harder and less acted upon by acids. This alloy will no doubt be the best surface for fruit cans.

(4978) C. L. R. says: Our 150 horse power Westinghouse engine gives a great deal of annoyance at night by the heavy exhaust. The company want to put in a sewer for the exhaust, but I am in doubt as to the plan. Hence write you. The sewer will be about 100 feet long, opening into a creek. If you can suggest a plan to help us, I shall be obliged to you. A. You can muffle the exhaust by turning it into a tank. A cylinder about 3 feet diameter, 4 to 5 feet long, set upon the roof, with a larger pipe to the open air. The cylinder may be made of thin plate iron, ⅛ inch thick. A drip should be inserted at the bottom. A common practice in New York is to fit a sleeve on the top of the exhaust pipe, to which attach a double cone drum of heavy galvanized sheet iron, which, for your 150 horse power engine, should be of about the capacity of the tank above mentioned. The opening at the top should be double the area of the exhaust. A baffle plate is put in the center and braced so as to break the direct flow of the exhaust direct through the drum.

(4979) W. P. M. writes: 1. In the winter of 1891-92 I built a small steam launch, length 25 feet, beam 5 feet. She will run, in slack water, 8 miles per hour, and is fitted with 1 horse power engine and boiler, which drives a three blade 16 inch wheel 500 revolutions per minute. I wish to know if I could not get more speed with an 18 inch wheel, or would it be taxing the engine too much? A. Whatever extra speed you may get with an 18 inch wheel must be derived from additional power in the engine, and to get more power from the engine means higher steam pressure. If your boiler is strong enough for the pressure required to give the engine 500 revolutions per minute with the larger wheel you may increase your speed. 2. In small launches, say under 40 feet, does increase of length, without a corresponding increase of beam, detract from safety or seaworthiness; or, in other words, is a launch, fitted with the same machin-

ery, 5 feet beam, 25 feet long, more safe than one 5 feet beam and 30 feet long? A. An increase in length for a given beam over the usual practice, or to the proportions named, may be made with safety; but precautions should be taken against shipping water in the choppy seas of the lakes. 3. What is the simplest and best way to make a sea anchor or drag, and what size should it be for launch 5 × 25? Should not care if boat drifted some. Simply wish to be in a position to be able to hold her head to sea in case of accident to machinery. A. For a sea anchor for your boat use a pine board, 1 inch thick, 18 inches wide, 4 feet long, with a couple of battens to stiffen it. Load one edge with lead or iron, so that it will float edgewise with the light edge 1 inch out of the water. Bore two holes near the bottom and ends and one hole at the top and middle. Fasten a three-part sling of ¼ inch rope through the holes, so that when the anchor is held at the intersection of the three ropes it will hang level. To the apex of the sling fasten the drag rope.

(4980) T. C. S. writes: We have been considering the construction of a dam across a tolerably small stream (fed by three springs), for the purpose of making a fish pond. What is the most approved dam, expense, durability, and convenience being considered? Will add that the incline on each side of the stream is, while not abrupt, rather steep, and that the area drained by it is not more than ten or twelve acres. A. The building of a dam, however small, should have more than a casual consideration, in view of the total flow that might come from a storm. The construction should also take its strength from the height and length, as also from the nature of the ground as to its stability to hold a dam, which also may indicate the depth necessary for a foundation. A curved stone wall, backed with clay and earth, with a central spill and riprap beneath is the best. Leffell's work on mill dams gives illustrations and description of many kinds of dams. $2.50 mailed.

(4981) E. L. O. asks: What is the scientific reason for the use of storm sash? Because they close the joints around the sash, or because heat condenses more rapidly on the glass than on other portions of the building? A. The reason is not a strictly scientific one—it is more a matter of comfort and convenience, the main object being to keep out the cold air that presses through the crevices around and between the sash in windy weather. It also prevents excessive circulation of the air within the rooms by cooling against a single glass and dropping to the floor—a dangerous source of cold to persons standing or sitting near a single window in cold weather. The double glass also keeps moisture and frost from windows, from the fact that the moist air of the rooms is prevented from coming in contact with the cold outside glass, the air between the glasses holding too little moisture to produce frost or condensation on the outer glass.

SELKIRK, PA., April 17, 1893.

To the Editor of the Scientific American:

DEAR SIR: I notice in your "Notes and Queries," No. 4889, F. H. asks what to do for the crank on his 14 × 16 center crank engine. I would say we are running the same kind of engine in our sawmill and had the same trouble he complains of. We tried all kinds of lubricants, but could not overcome the difficulty. Finally I took the brasses and had them counterbored and filled with No. 1 babbitt and bored out to fit the crank pin. Now we have no trouble and can run the engine without any trouble whatever with any kind of oil. Everybody at the shops said the babbitt would pound out, but it did not. Now all the engines in the mills in this section are fixed in the same way, and nobody experiences any difficulty. Hoping this may help some of your readers,

I remain yours truly,

WILLIS KERR.

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Signaling apparatus, electro-mechanical block, M. Corrigton 496,041
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Welding metal, A. J. Moxham 495,989
Wells, bailer for oil or artesian, W. Plotts 496,323
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Whisky, making, W. E. Bradley 495,956
Windmill, J. F. Reul 496,098
Windmill and pump regulator, P. A. Myers 495,992
Window screen attachment, J. Laurie 496,364
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Wrench, H. Cooper 496,190
Wrist turning machine, J. B. Peloquin 496,094

TRADE MARKS.

Beer, lager, O'Donnell & Duer Bavarian Brewing Company 22,867
Beer, lager, Star Brewery 22,868
Belting, leather, J. F. & C. G. Warren 22,863
Bluing, A. E. Palmer 22,889
Boot and shoe dressing, B. F. Brown & Co 22,890
Cigars, Silver State Cigar Company 22,864
Coffee, chiccory or a substitute for, Haesaert & Buysse & T. D. Floto 22,895
Confectionery, coloring matter for use in, G. Morris 22,888
Cotton dress goods, Smith, Hogg & Gardner 22,862
Fuller's earth, L. A. Salomon & Bro 22,891
Ketchup, chowchow, pickles, and other preserved fruits and vegetables, sauces, and jellies, H. Wichert 22,887
Medicated food for domestic animals, M. E. Savage 22,886
Medicinal pills and tablets, Frederick Stearns & Company 22,884
Medicinal preparation used as an anti fat and rheumaticide, Walker Pharmacal Company 22,878
Medicine for asthma and like affections, R. Schiffmann 22,880
Medicine for internal and external use, G. Bamford 22882
Medicine to prevent leanness, E. M. Beals 22,881
Metal, antifriction, Hyde Brothers & Co 22,892
Mineral spring water, natural, Stafford Mineral Spring Company 22,869
Optical instruments, J. E. Blackmore 22,860
Railway iron, switches, frogs, and car wheels and trucks, C. W. Hunt Company 22,893
Remedies, blood medicine, laxative compound and plasters, catarrh, E. Steinhauser 22,874
Remedies, certain named, F. C. Fowler 22,870
Remedies, certain named, Od Chem. Company 22,871
Remedies for catarrhal diseases, J. F. Paine 22,875
Remedies for throat and lung affections, A. Woolly & Son 22,879
Remedies for toothache, headache, neuralgia, and rheumatism, W. A. Davis, Jr 22,877
Remedies produced from the pineapple, proprietary, internal, T. E. Richards 22,883
Remedy for certain named diseases, J. K. Neagley 22,873
Remedy for internal and external use, and atomizers, McKesson & Robbins 22,872
Remedy for neuralgia, rheumatism, and like ailments, Friends Herbal Association 22,876
Shoes, ladies' fine, Sharood & Crooks 22,861
Sirup, alterative, J. D. Hutchinson 22,885
Varnish, Berry Brothers 22,894
Watches and parts thereof, American Waltham Watch Company 22,859
Whisky, A. Myers 22,865
Whisky, wines, champagnes, and liquors, Clover Leaf Wine Co 22,866

DESIGNS.

Bottle, A. P. Moore 22,370
Candle cuff, H. Seber 22,368
Match safe, L. Berger 22,366
Pocketbook, case, or wallet, C. Scheuer 22,362
Spoon, G. W. Shiebler 22,363
Spoon, C. P. Truesdell 22,364
Stove, oil, G. W. Cope 22,371
Tea pot, C. Osborne 22,369
Vessel, A. Steffin 22,367
Watch bridge, G. M. Rouge 22,365

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