RECENTLY PATENTED INVENTIONS.

Engineering.

STEAM BOILER FURNACE.—William C. Douthett, Pittsburg, Pa. The grate bar of this furnace is composed of a main section having in its top alternating heads and spaces and agitating sections provided with blocks operating in the spaces, and having lateral shoulders by which to engage the main section and limit the downward movement of the blocks. The grate bars are supported by shafts which form parts of rockers, and by rocking the shafts in one direction the blocks of one section of the grate bars are tilted upward, while by rocking the shafts in the other direction the blocks of the other section are tilted upward.

MOVABLE DAM, ETC.—William L. Marshall, Chicago, Ill. This invention relates to dams or sluiceway gates of the bear trap type, and provides a construction whereby sliding friction is avoided, all trouble from drift is obviated, and the greatest possible height of dam in proportion to width of leaves may be obtained, the dam easily closing flat, and being started from rest with the least head of water. The invention consists in extending the leaf that is effective in forming the dam one-half or slightly more than one-half of its width above and beyond the line of attachment of the two leaves, to increase the height or lift of the dam relative to the width of base, and at the same time reduce the volume of the hydraulic chamber. The two leaves are connected at or just above the center of pressure upon the extended leaf.

WELL PUMPING POWER.—George W. Grimes, Bluffton, Ind. An improvement has been devised by this inventor in power devices for operating pump rods or lines for either water or oil wells in great numbers from a central station, the improvement insuring uniform motion and great efficiency in the use of power. A post extends upward from a bedplate and a sleeve rotating on the post has an annular flange at its lower end with a groove registering with a groove in the bedplate, there being anti-friction balls in the grooves and a drive wheel secured to the lower end of the sleeve. A ring plate is mounted on the drive wheel eccentric to its axis, there being a pump line plate on the ring and anti-friction rollers carried by the plate and bearing against the periphery of the ring.

Railway Appliances.

GUARD FOR SIGNAL HANDLES.—George M. French, Mattoon, Ill. To prevent the improper handling of train order or block signals, from the neglect or forgetfulnes of telegraph operators and others, this inventor has devised a guard for pivotal attachment to the signal operating handle, the guard being provided with spurs which may be used as a file to receive orders and papers. When in safety position the guard will not interfere with the working of the signal, but when in danger position it prevents the operator from grasping the handle, and so calls his attention to the fact that it must not be moved, the train orders, etc., being brought immediately before the operator when he attempts to operate the signal.

Electrical.

BICYCLE LIGHT.—David W. Stinson, St. Louis, Mo. A strong and efficient light is provided by this invention, the electricity therefor being generated by the motion of the wheel, while a governor operates to maintain a steady and uniform power for the lamp. The lamp and generator are preferably held in a casing removably attached to the steering fork. A friction wheel engages the forward wheel of the bicycle, and a friction disk on a vertical shaft engages the side of the friction wheel, this friction disk being raised and lowered, as the speed of the wheel is greater or less, by means of a governor consisting of toggle joints separated by a spring. The vertical shaft rotates the armature within segmental field pieces, a high speed causing the friction disk to move in toward the axis of the friction wheel, while with lower speeds it approaches its periphery, thus maintaining the generation of a substantially uniform current.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co. for 10 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS, ETC.

STEAM AND HOT WATER FITTER'S TEXT BOOK. By Thomas E. McNeill. New York: David Williams. Pp. 140. Price $1.

A book which contains the substance of a course of lectures delivered at the New York Trade School to young workmen, or those who are fitting themselves to be such, in this special department of labor, ought to be exceedingly plain in its description, and thorough in its attention to details—a character which is fully borne out in this little text book. The contents are arranged in the form of question and answer, and the book has numerous illustrations. Any young plumber, desiring to take up this line of work, cannot do better than make himself master of the information here so concisely and fully presented.

The American Educator, a work in four large quarto volumes, is in course of publication, and announced to be completed about June 1, by the Syndicate Publishing Company, of Philadelphia, whose announcement will be found on another page. It promises to be a work of great merit, bringing down facts and figures to March 15 of this year. Although designed as a general encyclopedia of universal knowledge, it will give particular attention to the newest subjects, treating fully of the recently threatening bubonic plague; giving plans and details of the proposed new Hudson River Suspension Bridge, at New York; aeronautics and balloon voyages; battle ships and cruisers; agricultural chemistry, bacteriology, etc.; the latest electrical experiments, monetary theories, new inventions and discoveries, etc. The work will also be an up-to-date biographical dictionary and gazetteer of the world. Especial inducements are offered to those ordering the work in advance.

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Notes & Queries

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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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(7143) L. J. G. asks: 1. Could a storage battery be made from some small tumblers with lead plates? A. A storage battery could be made as described. It would be rather small for advantageous results. 2. Are the separate cells connected the same as a number of dry batteries? They are to be charged by eight bichromate of potassium batteries. A. Connect in series for charging. For use connect according to work they have to do. 3. What candle power are these batteries supposed to give? Each one contains 2 carbons and 1 zinc. A. You may allow about one candle power for a quart bichromate cell.

(7144) E. J. B. asks for a recipe for mixing coal tar, and applying it as a roof paint, also if it can be shaded by minerals and how. A. Coal tar for roof or fence painting can be mixed with any common dry mineral paints, such as chrome yellow, oxide of iron or Princes' metallic paint and thinned with naphtha or turpentine to allow of using a brush. The colors cannot be made bright, but will be of dark buff or brownish red.

(7145) A. W. asks how it would do to make the field magnet for the simple electric motor all in one piece of wrought iron 2½ inches in width by $\frac{7}{16}$ inch thick, and also could the armature core be made of an iron ring instead of the winding of the wire; would this give entire satisfaction? A. You can make the field as you specify, but the armature core should be of wire; by no means of solid iron. A solid core will be the seat of Foucault currents and will be a source of waste of power.

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