

and one pewter bottle. This was considered a very luxurious household outfit. Governor Benedict Arnold, of Rhode Island, and Mr. Pyncheon, of Springfield, Mass., bequeathed their pewter plates and dishes, and the humble pewter was just as elaborately lettered and marked with armorial devices as the silver objects.

Pewter was also used in New England for communion services. In 1729 the First Church of Hanover, Mass., bought, and used for years, a full communion service and christening basin of pewter. Some of the pieces are still preserved by the church as relics, while the tankards have been silver-plated and are still in use. As late as the dawn of the nineteenth century advertisements of "pewter communion flagons" appeared in New England newspapers. Pewter dishes and plates were a source of great pride to every colonial housekeeper, and much time and labor were devoted to polishing them with "horsetails" (*Equisetum*)

or "scouring rush," till they shone like fine silver, and dingy pewter was regarded as a disgrace.

In some old homes the pewter utensils have been preserved, and are even now cherished ornaments of the kitchen and dining room. Thus, in an old homestead in Shrewsbury, Mass., its greatest treasures are cupboards and dressers full of pewter dishes. All the plates and platters are round, for oval platters seem to have been then unknown.

Another pewter piece, still in use in some localities, is the hot-water jug with a wicker-covered handle. This, we read, was filled at night with boiling water and brought to the master of the house, for him to mix the apple toddy or sangaree for his household people, who drank out of pewter cups or heavy greenish glasses. Mrs. Earle, who has written very interestingly on the subject, and from whose writings some of the above statements have been derived, mentions two of these jugs which have been in daily use for certainly

forty years, for carrying hot water to bedrooms for shaving purposes, and they still retain the old wicker coverings on the handles, woven perhaps a hundred years ago. "These old pewter dishes, etc.," she continues, "have strange hiding-places. They lurk in tall and narrow cupboards by the side of old chimneys, or in short and deep cupboards over the mantel. They lie in disused fireplaces, or in deep boxes under wide window-seats, and under the dusty eaves of dark attic lofts; or on the highest pantry shelves, under cellar stairs, and in old painted sea-chests they have found a home."

The illustrations used in this article, with the exception of a few to which attention has been called in a foot note, are from photographs of historical pewter ware in the National Museum at Washington. As will be seen from the legends which accompany them, they represent a variety of objects used by persons of eminence in Colonial and later times.

RECENTLY PATENTED INVENTIONS.

Electrical Devices.

CIRCUIT-BREAKER FOR STORAGE BATTERIES.—H. GARRETT, Dallas, Texas. Mr. Garrett's invention relates to an improved circuit-breaker for storage batteries, and more particularly to an appliance for breaking the main circuit of the battery when the voltage reaches a predetermined minimum limit. When properly adjusted at the proper voltage, there will be absolutely no spark at all.

Engineering Improvements.

ROTARY VALVE.—D. W. RANTINE, New York, N. Y. The object in this invention is to provide a rotary valve which is very effective in operation, and arranged to accurately control the admission and exhaust of the motive agent, and thereby insure an easy running of the engine and utilization of the motive agent to the fullest advantage.

VALVE MECHANISM FOR ENGINES.—H. NIELSEN, New York, N. Y. In this case the purpose is to provide an engine arranged to insure a positive shifting of the engine-valve directly from the piston reciprocating in the cylinder, thus dispensing with complicated valve-gear, the arrangement being such that waste and leakage of the motive agent are reduced to a minimum, and the agent is utilized to the fullest advantage, so as to render the engine particularly well adapted for use as a pumping-engine.

ROTARY ENGINE.—C. GUYER, Muncy, Pa. This engine is arranged to utilize the motive agent very economically and expansively to the fullest advantage. Steam is cut off during a desired portion of the stroke of the piston, to allow it to work expansively. As the steam-pressure is equal on the ring and the disk, the piston is completely balanced, and hence the engine runs easily without undue loss of power and without waste of steam.

PROPELLER.—E. BRÜCKER, Cologne, Germany. The object here is to provide a propeller arranged to insure an effective forward as well as backward action by causing the propeller-blades to readily cut with the forward edges into the water, to allow the water to readily pass from the blades at their rear edges without danger of forming dead-water spaces, at the same time preventing undue resistance and concentrating the active force at the middle portion of the blade, to increase the propelling effect of the propeller when driven forward or backward, and to reduce slip to a minimum.

Heating and Lighting.

FEED-WATER HEATER AND PURIFIER.—T. V. ELLIOTT, Columbia, Pa. This invention is an improvement in feed water heaters for use in connection with steam-boiler furnaces. The water supplied to the feed-water heater is raised to a comparatively high temperature before being discharged into the boiler, and by reason of the upward circulation of the water in the manifolds the water will be purified within the feed-water heater before being delivered into the boiler.

FURNACE.—T. V. ELLIOTT, Brooklyn, N. Y. In this instance the improvement is in furnaces, particularly smoke and gas consuming furnaces, and especially in that class in which oil, air, and steam are utilized in securing a consumption of the gases and other products of combustion; and the invention relates to means for securing the return of the gases and smoke and a disposition thereof within the furnace.

BOILER-FURNACE.—E. F. COMBER, Selkirk, Canada. One object the inventor has in view is the provision of a bridge-wall by which warm air in regulated volumes may be supplied to the combustion-chamber of a furnace at a point back of the fuel-grate, the air being free to commingle with the gaseous products of combustion and calculated to promote the combustion of the gases and of carbon in the smoke. Besides with steam boilers, the improvements may be used in hot-water boilers and in connection with any kind of furnaces for power and heating purposes.

Miscellaneous.

SHOE-LACING.—J. MCMAHON, Bemidji, Minn. The purpose in this invention is to provide an anchorage device for one end of the

lace secured at the lower portion of the front opening for the upper of the shoe adjacent to the vamp and a series of pulley devices which are secured to the upper quarters at opposite sides of the front opening which devices are guides for the lace and are in alternate arrangement, and to provide the upper quarter of the shoe at opposite sides of the upper portion of its front opening with guide hooks.

PHOTOGRAPHIC CAMERA.—H. W. HALES, Ridgewood, N. J. The object of the improvement is the provision of a camera arranged to produce an exceedingly sharp and brilliant image on the focusing medium and subsequently on the sensitive plate or film in such a manner that the operator while focusing can view the image right side up or non-inverted.

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

Business and Personal Wants.

READ THIS COLUMN CAREFULLY.—You will find inquiries for certain classes of articles numbered in consecutive order. If you manufacture these goods write us at once and we will send you the name and address of the party desiring the information. In every case it is necessary to give the number of the inquiry. MUNN & CO.

Marine Iron Works. Chicago. Catalogue free. Inquiry No. 4908.—For manufacturers of small brass or gilt chain.

For mining engines. J. S. Mundy, Newark, N. J. Inquiry No. 4909.—For makers of small brass caps such as used on pencils.

"U. S." Metal Polish. Indianapolis. Samples free. Inquiry No. 4910.—For manufacturers of common wood button molds.

AUTOS.—Duryea Power Co., Reading, Pa. Inquiry No. 4911.—For manufacturers of pressed metal in No. 18 steel and about 9 inches diameter.

Handle & Spoke Mch. Ober Mfg. Co., 10 Bell St., Chagrin Falls, O. Inquiry No. 4912.—For manufacturers of carpet-cleaning machinery.

Sawmill machinery and outfits manufactured by the Lane Mfg. Co., Box 13, Montpelier, Vt. Inquiry No. 4913.—For drawings or blue print of a 4 h. p. horizontal gasoline engine.

Manufacturers of patent articles, dies, metal stamping, screw machine work, hardware specialties, machinery and tools. Quadriga Manufacturing Company, 18 South Canal Street, Chicago. Inquiry No. 4914.—For hard rubber, glass or porcelain jars for battery use; to be rectangular in shape of special dimensions.

American inventions negotiated in Europe, Felix Hamburger, Equitable Building, Berlin, Germany. Inquiry No. 4915.—For a thermometer having an indicator at a distance from the tested material.

Special and Automatic Machines built to drawings on contract. The Garvin Machine Co., 149 Varick, cor. Spring Streets, N. Y. Inquiry No. 4916.—For manufacturers of attachments for invalids' tables, for holding medicines, books, papers, etc.

Edmonds-Metzel Mfg. Co., Chicago. Contract manufacturers of hardware specialties, dies, stampings, patented devices, etc. Inquiry No. 4917.—For machinery for forming and bending steel.

WANTED.—Partner with capital to manufacture bottle stopper, made of glass and hard rubber. Address Partner, Box 773, New York. Inquiry No. 4918.—For manufacturers of laundry machinery.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway New York. Free on application. Inquiry No. 4919.—For manufacturers of large and small paint mills and grinders.

The largest manufacturer in the world of merry-go-rounds, shooting galleries and hand organs. For prices and terms write to C. W. Parker, Abilene, Kan. Inquiry No. 4920.—For addresses of seed growers and seedsmen in America.

Empire Brass Works, 106 E. 129th Street, New York, N. Y., have exceptional facilities for manufacturing any article requiring machine shop and plating room. Inquiry No. 4921.—For straw presses that will tie, bale, and deliver bales automatically from the press.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company, Foot of East 138th Street, New York. Inquiry No. 4922.—For makers of money alarm drawers.

Inquiry No. 4923.—For the present address of the Nashua Tilt Co. Inquiry No. 4924.—For the address of the manufacturers of the "Farmers' Windmill."



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.

Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.

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.

(9256) H. W. H. writes: What per cent of power per horse power of heat is lost in the water used by a gas engine? A. It is impossible for us to give you any definite answer to the question. We would say, however, that in a general way it is true that a gas engine utilizes, as a rule, less than 25 per cent of the heat generated, and about half of the loss is usually carried off by the jacket water.

(9257) O. C. S. says: Can a man working but a short time do twice as much work when turning two cranks, such as are used in a boring machine much used by carpenters, as he can when turning but one crank and standing in the most favorable position? If not, why not? How much can he do compared with a man turning a single crank? When working all day can a man do any more turning two cranks than he can when turning one crank? Please give figures showing the relative amount of work done. A. In reply to your inquiry regarding the amount of work that a man can do when turning two cranks, such as are used in a boring machine, as compared with the amount that he could do turning but one crank, we would say that there is no definite data on this subject. The amount of work that a man can do in a given length of time is greatest when the motions required of him are the most natural and most favorable to the strength of his muscles. Thus, as work is a product of force times distance, a man is able to do but very little work when the force required is so great that he can overcome it through only a short distance in a given amount of time. On the other hand, he will accomplish little work if the force is very small, and he is required to work too rapidly. Between these limits there is a relation of force to speed in which he can do the maximum work. A man can accomplish no more turning two cranks than he can accomplish turning one crank, provided the one crank is so arranged that he can work favorably with both arms upon it, and exert a force which will give the most favorable relation between force and speed to produce the maximum work. Practically, it is found that the two cranks set at 180 degrees in a boring machine, similar to the pedals of a bicycle, give a condition which is exceedingly favorable for the average man to do his maximum work.

(9258) H. A. P. says: Will you kindly answer the following questions? I have two coils of 1-inch pipe. One is 11 inches and the other is 5 inches in diameter inside measure; both have seven and a half turns. The small coil fits inside the large coil and is coupled at top and bottom. The flow must heat to 30 deg. beneath a "hover" 72 feet by 24 inches by 6 inches, returning through the "run," 72 feet by 3 feet by 3 feet, heating to about 60 deg. Would a double or triple line of pipe be suggested, and what size (pipe)? Will I place the expansion tank on the flow, or return, close to heater or otherwise? The pipe will be on a level. A. You have not given us information enough in your inquiry to make it possible for us to answer your questions. Without knowing exactly the heat to which your coils are subjected, we cannot tell

you the rate of circulation or the amount of heating surface needed to raise the water to any given temperature.

NEW BOOKS, ETC.

THE NEW INTERNATIONAL ENCYCLOPEDIA. Volume X. Infantry to Larramendi. Edited by Profs. Daniel Coit Gilman, LL.D.; Harry Thurston Peck, Ph.D., LL.D.; Franklin Moore Colby, M.A. New York: Dodd, Mead & Co. 1903. 8vo. Pp. 936.

In taking up the tenth volume of this truly important work, we are more than ever convinced of the great merit which this encyclopedia possesses. Its treatment of all subjects is most admirable, and the scientific articles and definitions are both concise and reliable. The illustrative features add greatly to the interest of the volume. The inclusion of the lives of living persons is especially to be commended. The maps are fine examples of the cartographer's art. Technical matters are far from being neglected; thus, under "Ink" we find a very common-sense discussion of black ink, red ink, blue ink, aniline inks, metallic inks, special inks, sympathetic inks, ink powders, and printing inks, together with several bibliographical references of considerable value. The good points of the general scheme of the encyclopedia are emphasized by the sustained work which characterizes each successive volume.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending December 15, 1903.

AND EACH BEARING THAT DATE [See note at end of list about copies of these patents.]

Table listing various inventions and their patent numbers, including items like Abdominal support, Acid and cyanid salt, Air brake safety device, etc.