RECENTLY PATENTED INVENTIONS.

Engineering.

STEAM ACTUATED VALVE. — Henry Breitenstein, Laramie, Wyoming. For direct acting duplex engines this inventor has provided an improvement designed to utilize the steam to the fullest advantage, the construction being simple and durable. The two cylinders are each connected at one end with the opposite end of the other cylinder, the pistons moving in opposite directions in the cylinders, a slide valve controlling the inlet and exhaust ports of the cylinders, while there are puppet valves actuated by the pistons, and differential auxiliary pistons carrying the slide valve and controlled by the puppet valves.

STEAM TRAP. —Henry Creamer, New York City. This is a device of simple and durable construction for automatically conducting water of condensation from engines, steam heating systems, etc., back to the boiler. A receiver for the water of condensation is connected by a port with a fixed neck held on the cylinder and containing an inlet valve adapted to open on the down stroke of the pump piston to admit the water, there being a valve for discharging the water from the piston. The pump is stopped and started according to the quantity of water of condensation received by the receiver, and the pistons of the valve being steam cushioned, their action is comparatively noiseless.

LIQUEFYING GAS.—Francis B. Deane, Lynchburg, Va. To liquefy gas by compression, this inventor has provided a combined hydrostatic press and pump especially adapted to do the work effectively and economically. It comprises twin cylinders in which operate hollow pistons having annular enlarged upper ends and fixed hollow plungers fitting their main bore, the plungers having at their lower end a valved inlet and smaller valved outlet, and being surrounded by annular chambers communicating with the pistons. The gas is first partially compressed, then forced into a much smaller chamber and reduced to liquid form, at the same time that a fresh supply of gas is being drawn in.

VITRIFICATION FURNACE.— Peter K. Sommer, Mannheim, Germany. This furnace comprises a set of gas burners in an inner burning chamber lined with refractory material and surrounded by an outer cylinder for the combustion gases, there being a second outer chamber through which the air passes to the gas burners. The furnace is especially designed for enameling the bottoms of cooking vessels, facilitating the application of heat not only to the bottom but to the sides of the vessel to be enameled.

Railway Appliances.

CAR COUPLING.— Battie K. Richardson, Nashville, Tenn. This is a coupling of the side latching type, of simple and durable construction, and adapted for automatic coupling with a similar coupling on another car, while the uncoupling may be effected from the sides or top of a car. It comprises a chambered drawhead within which are two oppositely pitched inclines, a pivoted latch block riding on the inclines when partially rotated, and sliding by gravity to interlock a notch on its under side with a shoulder on one incline. The device may be conveniently connected with an ordinary car coupling of the link and pin style. Some of these couplings have been tried in actual service, and are said to have proved highly satisfactory.

TRACK SANDING APPARATUS.—Oliver P. Murry and James V. K. Walker, Portsmouth, Va. According to this invention, a valve operating in unison with the engineer's brake valve controls an air blast from the main air reservoir to the sand discharge pipe. When the brake handle is in "full release" or in "running" position the supply of sand to the track is shut off, but when the handle is moved to "lap," before applying the brakes, the sand commences to run, and is forced out when the engineer's valve is moved to put on the brakes, a large quantity of sand being forced upon the rail when the handle is moved to the emergency stop.

CATTLE CAR.—Ferdinand E. Canda, New York City. The protection of the feed and water troughs of a cattle car against injury when the car is loaded with general freight is the design of this improvement. Ordinarily the posts of the car are made wide, to allow the troughs to be folded up between them, and thus protect the troughs from injury, but according to this invention the troughs are pivoted between the posts and are flanked by protecting blocks, brackets and a guard rail, allowing the width of the posts to be greatly reduced, and at the same time effectively protecting the troughs from injury by freight.

TRAIN ORDER AND SIGNALING DEVICE.—Leonard T. Crabtree, New London, Wis. This is an improvement upon formerly patented inventions of the same inventor in devices for railroads using the block signal, and embracing mechanism for the control of moving trains, embodying also a train signaling device and a co-operating train order annunciator. Combined with a rotatable pendently supported signal blade, a top-heavy gravity block pivotally supported near its lower end, and a device connecting the block with the blade, is an electrical device which when active holds the block nearly upright, and releases the block to allow it to rock when the electrical device is dormant. The invention also embraces various other novel features designed to simplify the construction and insure certainty of action.

Mechanical.

CARPENTER'S AND JOINER'S SQUARE. —Solomon H. Bretz, Battle Creek, Mich. This is a composite tool in which the limbs are jointed together and graduated on arcs of circles defined by two undercut opposite shoulders on one limb, and bevel edged and mating curved flanges on the other limb, the flanges having a sliding contact with the shoulders and being radially coincident. The implement has also a plumb and level attachment, and rafter and brace tables to indicate lengths for such parts of a building, the tables being impressed upon a sunken portion of each limb, and thereby protected from obliteration by wear.

WIRE SWAGING MACHINE. — Albert De M. Ramacciotti, New York City (executor of Francis Ramacciotti, deceased). This is a machine especially adapted for swaging wire strings for musical instruments, the machine being adjustable to operate upon strings of various lengths and of high temper, leaving the strings at their flattened surfaces smooth and flawless. The improvement comprises a sliding carrier provided with a swaging block, a second carrier bemg an adjustable wedge section at a right angle, while a block section may be adjusted by the wedge section in direction of or away from the sliding carrier, the block having a swaging jaw adapted to face that of the sliding carrier.

MILLSTONE DRESS.—Joseph H. Brown, Madison, Ga. According to this improvement the millstone has main furrows and auxiliary furrows extending to the skirt of the stone, and at the center the face is sloped slightly toward the eye or draft circle. Across the main and auxiliary furrows are shoulders facing inwardly, the dressing being of a novel character to partially overcome centrifugal force on the coarse particles, while preventing regrinding of fine particles to cause heating and undue wear of the stone. Stones with this dress can be run farther apart, and with less friction and cooler, than has been usual heretofore.

Miscellaneous.

WHEELED SCRAPER.—William Ackerman and Albert A. Hasselquist, box No. 532, Elgin, Ill. This is a machine carrying a scoop, and adapted for scraping roads or similar work, the scoop being entirely under the control of one man, who may also drive the team by which the machine is drawn along. The construction is simple and the scoop may be held positively in the position desired according as the ground is to be scraped, or it may be raised to a carrying position above the ground, being raised or lowered at the will of the operator, and dumped by the action of the team.

WAGON DUMPING DEVICE.— Charles H. Peardon, Smithshire, Ill. This inventor has provided improved means for elevating a loaded wagon and the subsequent dumping discharge of the load automatically. A framed structure is erected to afford an inclined way to the point where the dumping is to be effected, and at such place a platform is supported by a transverse shaft, whereby the platform may be rocked to tip the wagon body, there being connected with the structure a draft cable for attachment to a wagon, whereby the latter may be drawn up, on the application of power from a suitable source, and its load dumped when the platform is tripped.

PROPELLER. — Martin Davies, Jersey City, N. J. This inventor has provided an improved means of securing propeller blades to the hub or end of the screw shaft. The hub has radial bores, countersunk on the inner side, and the propeller blades have a perforated base, and screw bolts have their heads fitted in their countersinks and their shanks projected outward through the hub and bases of the blades. The heads of the bolts are preferably arranged to form part of the smooth hub bearing for the propeller shaft. This invention has been practically tested in a working propeller, and has been demonstrated to possess decided advantages.

PNEUMATIC VALVE.—Fredrick Fichter, Rockaway, N. J. This is an improvement especially adapted for use in connection with inflated cushions, pneumatic tires, etc. The valve is provided with double cushions, and within one casing two valves are made to act in conjunction, both valves to be employed when the inflation is to be effected, after which one is to be removed. The valve is of simple and durable construction and ready application, and, when closed, the escape of air through it is impossible.

DRUGGIST'S STILL.—Charl s R. R. Beck, Baltimore, Md. The conical condensing hood of this apparatus has at its apex a filling opening, and from base to top is surrounded by a water jacket, with inlet and outlet openings near the top and bottom to permit water circulation, while there is a base trough and a supplemental trough above it within the hood, the latter provided with a discharge pipe. The improvement affords improved means for distilling various extracts and waters, collecting all the condensations and conducting them out of the still, instead of permitting some of them to fall back into the heating vessel.

ENVELOPE OR STAMP MOISTENER.— Henry A. Fry, Chicago, Ill. This is a simple device to be conveniently worn on the thumb, to facilitate the rapid and efficient moistening of stamps and envelopes. It comprises a reservoir and keeper for attaching the reservoir to the hand, in connection with a moistening pad arranged beneath, and a valve-controlled connection between the reservoir and pad. The device may be very quickly operated, the shape of the pad enabling the moisture to be evenly applied.

CLAMP JOINT. — Frances Higbie, Brooklyn, N. Y. This is an extremely simple device, comprising a vertical standard or support, in the form of a rod, on which a bracket is conveniently adjustable up or down, while a base piece in horse-shoe pattern has at one edge a neck with an opening adapted to receive the lower end of the vertical standard, with which it is engaged by a clamping arm. The device affords a convenient means of supporting a cooking vessel at such height as desired above a lamp, the vessel being placed on the bracket, of a construction adapted for the purpose, and the lamp base being encircled by the base piece.

FAN.—Edward Ross, Brooklyn, N. Y. This is an improvement in fans having a folding web adapted to open in circular form, and the invention describes a simple and durable fan, which can be readily opened and closed and locked in either position. The handle is made solid, and not in two parts, as usual, giving the fan a neater appearance, and its web can be easier opened or closed without changing the grip on the handle.

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.

THE LATIN LETTER OF COLUMBUS. Printed in 1493, and announcing the discovery of America, reproduced in facsimile, with a preface. London: Bernard Quaritch. 1893. Pp. vi, 8. Price 30 cents.

HARIOT'S NARRATIVE OF THE FIRST PLANTATION OF VIRGINIA IN 1585. Printed in 1588 and 1590, reprinted from the edition of 1590 with De Bry's engravings. London: Bernard Quaritch. 1893. Pp. vi, 46, 25 plates. Price 60 cents.

THE SPANISH LETTER OF COLUMBUS WRITTEN BY HIM ON FEBRUARY 15, 1493. To announce the discovery of America. Reproduced in facsimile from the unique copy of the original edition. (Barcelona, April, 1493.) With a translation and introduction. London: Bernard Quaritch. 1893. Pp. xiv, 18. Price 40 cents.

These three very elegant publications are explained by their titles. They are of wide interest among those who occupy themselves with the early history of the continent. The illustrations in some cases are exceedingly interesting.

EXPERIMENTS ON AIR. PAPERS PUBLISHED IN THE PHILOSOPHICAL TRANSACTIONS. By the Hon. Henry Cavendish. Edinburgh: William F. Clay. London: Simpkin, Marshall, Hamilton, Kent & Co., Limited. 1893. Pp. 52. No contents, no index.

Cavendish's famous work referring to the period of 1784–1785 figures as the third of the Alembic Club reprints, and certainly cannot be considered the least valuable or interesting of them. This work will certainly find its way to all chemical libraries. The absence of a contents and index we feel, however, cannot but be regretted.

LES MERVEILLES DE L'EXPOSITION DE CHICAGO. By N. Melnikoff. Odessa, Russia: 32 Rue Catherine. 8vo. Pp. 96, illustrated.

This work, which is in Russian, describes the principal exhibits. It is curious to note that M. Melnikoff is greatly in favor of introducing two articles into Russia which have generally been regarded as strictly American —peanuts and popcorn.

SCIENTIFIC AMERICAN BUILDING EDITION.

DECEMBER, 1893.—(No. 98.)

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Notes & Queries

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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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(5543) F. G. H. asks: 1. Are No. 18 and No. 25 good sizes of wire to use on a medical coil? A. No. 25 wire is too thick. Use No. 30 or finer. 2. Which magnet will give the strongest current, one 4 inches long, wound with 1 ounce No. 18 and 3 ounces No. 24, or one 2 inches long wound with 1 ounce No. 18 and 3 ounces 24? A. If you refer to horse shoe magnets, the shorter one, if of same diameter of core, should give the best effects.

(5544) J. O. J. asks: 1. Is tungsten steel the same as Mushet steel, and what tempering it requires to make permanent magnets (suitable for voltmeter, etc.)? A. Mushet steel and tungsten steel are much alike in their quality of soft tempering, but may not be of the component alloys. They must not be dipped in water for tempering, simply cool in the air. 2. I have in mind a silvered glass reflecting telescope. Mirror 4½ to 5 inches diameter and 3 feet focal length. Are the measures well proportioned? A. A good proportion for a reflecting telescope is 12 times the diameter of the mirror for the focal length. 3. Is it necessary to grind the mirror to the meniscus form, or will a plano-convex do? Will the silvering process described in last week's SCIENTIFIC AMERICAN be applicable to silvering it? Where can I get considerable general information regarding reflecting telescopes? A. The silvering should be on the front surface, which should be perfectly polished to the proper curve. For the silvering process and description of requirement for grinding and polishing for astronomical telescopes, see SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 581, 582, 583, 10 cents each mailed.

(5545) J. F. H. says: Will you kindly explain through the SCIENTIFIC AMERICAN what is the difference between a mechanic and a machinist? A. A machinist is a mechanic, but all mechanics are not strictly machinists. Carpenters, wagon makers, millwrights, cabinet makers, and every one skilled in the practice of the mechanic arts are properly mechanics. Machinists are more properly constructors of machines and engines, and versed in the principles of construction of machinery.

(5546) M. P. H. asks: What progress, if any, has been made in hardening copper? Has any one since prehistoric times been able to get it so it would take a razor edge and hold it? If not, what would you think of a process that could harden an alloy of 85 per cent copper and 15 per cent tin to that degree that it would take and hold an edge sufficient for all wood-working tools? If this result has not been attained by any one else, I will send a specimen of what we have. A.