RECENTLY PATENTED INVENTIONS.

Engineering.

BOILER SETTING.—Charles V. Kerr, Fayetteville, Ark. The setting and furnace of the boiler are so constructed, according to this invention, that the flames are carried twice the length of the boiler before entering the boiler tubes, the flames impinging upon the bottom and sides of the boiler in such a way, through a novel arrangement of flues in the masonry, as to produce an even heat, and utilize all the heat before the smoke enters the stack, thereby giving great efficiency with economy of fuel.

PUMP.—Vett S. Reed and Daniel Apgar, Loveland, Col. This is a rotary pump in which the casing has a fixed transverse partition from which leads a platform, inclines leading downward to the bottom of the casing, while a rotatable piston head carries a series of pistons arranged to slide through it, and a plate spring fixed to the top of the stationary casing is arranged over the partition in the circular path of the several pistons, the free end of the spring bearing upon them as they pass successively beneath it and drop off the platform. The invention constitntes a lift and force pump designed to be very efficient and to utilize the power to the greatest advantage.

Railway Appliances.

DRAWBAR GUIDE.—Heinrich W. F. Jaeger, Sandusky, Ohio. This is a device adapted to be readily applied on the draw timber of freight cars. It has on its inner face a recess for receiving the followers, end flanges to be bolted to the inner face of the drawbar timber, an offset extending out from the guide between the flanges to engage a recess in the inner face of the drawbar timber, and a rib projecting from the offset to engage a further recess in the drawbar timber. An essentially horizontal flange extends outward from the guide at the bottom, and beyond the outer face of the rib, the flange being adapted to be bolted to the bottom surface of the drawbar timber.

HAND CAR.—Joseph McMurrin, Shoshone, Idaho. According to this invention, the propelling mechanism for the car is arranged at its ends, instead of near the center of the car, to leave a clear space in the center in which ballast, rails, etc., may be piled. A simple, strong and easily operated driving mechanism is provided, pinions on the axles being turned by gear wheels, actuated through a crank from a driving rod, the latter being driven by a hand lever.

Electrical.

ARC LAMP.—Harold E. Bradley, New Bedford, Mass. In this lamp are a feed rod and tilting lever, and main and shunt magnets to tilt the lever and operate the feed rod, with a spring plate cut out and a relatively stationary plate in its path of travel. The improvement is designed to simplify and cheapen arc lamps and improve the feed, while the resistance and cut-out automatically short circuit the lamp if the current becomes too strong. The lamp is durable, easily placed in position and designed to give a steady light.

Agricultural.

PLOW.—Richard E. Hopkins, McGaheysville, Va. The point may be slid into the share of this plow so as to project a considerable distance beyond, or be withdrawn within it, rendering the point as long or as short as desired, or it may be so located that when thrust outward it will have a downward as well as an outward movement, being extended or withdrawn while the plow is running. There is also a vertical cutter at the forward portion of the share, and a horizontal shear cutter at the lower forward side of the wing or mold board, the shears or cutters being readily removed for sharpening and quickly and easily replaced.

POTATO PLANTER.—Millard F. Myers, Greenville, Ohio. This machine is designed to feed either large or small seed, depositing it in the hill. A horizontally rotating planting disk has a series of adjustable pockets, there being a driving connection between the axle and the disk, over which is a hopper containing the seed. Two operatives are necessary to work the machine and place the seed, but the machine is of very simple and inexpensive construction and designed to be very effective.

FERTILIZER DISTRIBUTER.—Lewis Roat, Milton, Pa. This machine consists of a hopper-like body supported on wheels in such way that it may be used as a cart when not employed as a fertilizer distributer, and there is combined therewith a removable pulverizer and spreader composed of a toothed cylinder, a detachable shaft having a spline connection with the cylinder, a drive shaft connected with the detachable shaft, and means which operatively connect the axle and drive shaft.

HAND SEED SOWER.—William R. Bowen, Clayton, Fla. This is an inexpensive device for sowing ordinary garden seeds or for sowing broadcast small seeds, fertilizers, insecticides, etc. It consists of a cup with a handle and rounded bottom, near the center of which is a good-sized opening, while to the bottom are journaled two disks—a dropping disk and a broadcast disk. The former has a series of openings to permit the discharge of seed when the disk is adjusted in register with the larger opening in the cup bottom, while the broadcast disk has other adjustable openings for the discharge of seed, insecticides, etc.

HOP CLEANING MACHINE.—Raphael M. and John P. Mackison, North Yakima, Wash. This machine has an elongated frame supporting an inclined bed with a carrying apron to carry away the dirt, dust, leaves, etc., deposited by the hops, which are delivered to a carrier or apron from a chute in the upper end of the frame. Means are provided for adjusting the bed, which is adapted to clean the apron on its under side, and the construction is such that perfectly clean hops may be delivered rapidly from one end of the machine.

Miscellaneous.

SPRINKLER HEAD FOR AUTOMATIC FIRE EXTINGUISHERS.—John H. Dixon, Marietta, Ohio. This is a device for systems which become operative when the heat rises above a certain temperature. It has fusible parts arranged in such a way that they do not direct y or indirectly affect the sealing of the head, which is normally closed by an automatic valve so supported that the water pressure forces it open when the fusible stops are softened. The valve also forms a deflector to throw the water evenly around all sides of the sprinkler head.

BOOT TREE.—William J. Yapp, 210 Sloane Street, London, S. W., England. This device has a toe and heel portion, jointed to which is an intermediate adjustable thrust rod adapted to act as a toggle to apply pressure to the front or toe portion. The action of the device applies the pressure in an upward thrust against the front of the upper near the instep. This boot tree is very light, easily applied and adjusted, and may be packed away in small space.

BOX LIFTER.—Henry Eddishaw, Philadelphia, Pa. For handling boxes placed overhead out of ordinary reach, this inventor has devised a light and easily operated device which may be used instead of a ladder, for facilitating the taking down of the box. It comprises a supporting pole, on which is a head with upwardly extending arms, a shelf being supported beneath the head, and one of the parts being revoluble with respect to the other. There is a lever mechanism at the lower end of the pole for operating the shelf, which slides on the pole, and a pivoted lever for engaging the end of the rod projecting from the shelf, so that the box may be handled with safety by the device, without fear of dropping it.

WALL PLASTER COMPOSITION.—James E. Summers, Clifton Forge, Va This is a composition which freezing does not injure and moisture does not penetrate. It is made of pulverized lime, cement, plaster of Paris, pulverized furnace slag, and other ingredients in specified proportions, made of the desired consistency with water. As a plaster it can be easily finished with one coat, becoming as hard as stone.

DENTAL PLUGGER.—Augusto A. Nouel, Jr., Puerto Cabello, Venezuela. This invention consists of a head or stock fitted to slide and having a socket to receive the point or tool, a spring-actuated hammer engaging the head and a hand lever lifting the hammer and then releasing it to permit it to suddenly exert its force on the head. The construction is simple and the device works automatically.

COPY BOOK CABINET.—Robert E. Ashbrook and Milton H. Ingram, Paducah, Ky. In this case or cabinet the books will be kept from warping and getting out of shape, the leaves being kept smooth and prevented from drawing up. It has a movable shelf guided by or carried to or from a stationary shelf by exterior mechanism, and the case may thus be made to take the place of a letter press for ordinary letter copying. The framework consists of skeleton sides, between which the shelves are arranged in pairs, one shelf of each pair being stationary and the other adjustable to or from it.

VEHICLE DOUBLETREE.—Samuel J. McDonald, Gallatin, Mo. According to this invention, where the doubletree is pivoted on the draught pole, the ends of a curved bar are secured to the doubletree, the bar having on its under side spaced ears projecting down on opposite sides of the pole, while a forked brace plate is secured to the doubletree and to the curved bar. The attachment is designed to obviate the tendency of the doubletree to rock on its coupling bolt under strain, and prevent the elongation of the bolt hole.

FIFTH WHEEL.—Samuel K. Paden, Petersburg, Ohio. Combined with an axle and wooden bolster having recesses or sockets in opposite sides is a base plate having pendent, parallel, integral flanges which closely embrace the sides of axle and bolster, pendent tubular bosses fitting in the bolster sockets. The mvention is an improvement in that class of fifth wheels in which the king bolt or analogous connection is dispensed with, and plates or disks rigidly attached to the axle and bolster are employed, the disks rotating on each other and being held together by side clips.

SASH FASTENER.—Ferdinand F. Unkrich, Galion, Ohio. The working parts of this device are adapted to sound an alarm if tampered with. It is a sash lock of simple and inexpensive character, adapted to retain the sash at any desired point of sliding adjustment, affording means of securely locking the sash either entirely open, partly open, or completely closed.

CULINARY VESSEL.—David C. Wood, Matamoras, Pa. This is a double-walled vessel, with a bottom and side space for water and steam, the cooking being effected in the interior compartment. The cover has a connection with the side steam space, and is provided with a steam exit, and the cover also has a steam chamber which covers the entire inner compartment, the heat from the steam compartment of the cover contributing to the cooking at the top of the articles in the inner vessel, and the cooking being effected without danger of burning.

ROASTER.—Neils H. Jensen, Philadelphia, Pa. This construction is more especia ly designed for roasting coffee beans, cocoa, etc., without requiring a large amount of fuel. It comprises a lower furnace and an upper spherical roaster having trunnions journaled in the furnace door to swing with it, the roaster having a covered opening for inserting and removing its contents, and an outlet at right angles for shells and impurities, there being a flaring or dished shield on the interior of the roaster around the outlet opening.

HEATING DRUM.—Henry I. Grennell, Ashland, Wis. This is a drum to be ordinarily inserted in the pipe to form a passage for the smoke and gases, and a controllable passage for air, to be heated thereby and contribute to the heat of a room, the drum being readily connected with stoves, furnaces, etc. The passage of the smoke and gases through the shell of the drum is retarded, that they may give up all their heat to the regulated air currents for which channels are provided through the drum.

BOX TOP.—Lyman Miller, Lexington, Ky. This is an improvement readily applicable to show cases, packing boxes, etc., and is cheap enough to be applied to almost any box or case. It is a top or side of such construction that the boxes or cases in which it is used may be piled safely one upon the other, and yet have the goods in them readily displayed. The improvement comprises a pair of swinging doors, a tight joint being formed between them, and the doors being closed automatically by a spring attachment. When one of the doors is swung open, a stop holds it in open position for such time as desired against the tension of the spring.

LOGGING APPARATUS.—Anderson W. Brown, Rhinelander, Wis. For drawing logs over icy roads this invention provides a sleigh-carrying engine and boiler, there being on the sleigh transverse shafts having sprocket wheel and chain crank connection with the engine, the shafts operating eccentrics with legs whose feet have cutting toes. The latter engage the ice in the road to push the apparatus forward, the eccentrics being so set that some of the legs wi l always be pushing, and the apparatus being designed to draw heavy loads, and move forward evenly.

MECHANICAL DOLL.—Daniel S. McElroy, New York City. Movable legs, arms and head are so connected, according to this invention, that by moving one of the arms the leg on that side will be moved in the same direction, the same movement also causing the turning of the head. The leg and arm of either side are connected by a train of gearing, and on the pivot of one of the arms and on the neck are engaging bevel wheels, the moving of one of the arms causing the legs to move in imitation of walking, the head at the same time turning from one side to the other.

DESIGN FOR A WASH BOARD PLATE.—James A. W. Sears, Menominee, Mich. In the upper side of this plate are parallel transverse ribs and intervening flat surfaces, the flat under side of the plate having rounded grooves opposite the ribs of the upper side.

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue

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.
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 prompt y supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(6241) A. N. J. writes: 1. An empty tin can 9½ inches long and 4½ inches square, with an opening ¾ inch in diameter at the top, well corked so as to be air tight, was sunk in about 70 feet of water. The cork was withdrawn while at that depth, and upon pulling the can to the surface the can was badly crushed in. Can you tell me when the collapse took place, and what was the cause thereof? A. The can probably commenced to collapse at a few feet below the surface, as its square form had but very little resistance to the increasing pressure as it sank, which at 70 feet would be 30 pounds on each square inch of its sides. The air on the inside had no resistance until it was compressed by the collapsing sides. 2. Will brass stop cocks injure, for photographic purposes, hyposulphite of soda and alum solutions? A. Brass stop cocks are not suitable for hyposulphites. The sulphur attacks the brass.

(6242) W. G. J. asks: Can rubber be mixed with asphalt so as to make it flexible? A. By masticating pure raw rubber in benzole, and thinning asphalt with the same or with naphtha, the two can be mixed by grinding or rubbing, and the benzole, etc., can then be disti led off. The mixture may be quite flexible. The use of turpentine instead of benzole will make it more flexible and sticky.

(6243) F. F. M. says: Can you give me a formula for glycerine of cucumber?

A. White castile soap..... ½ oz.
Pommade de concombre... ..... 1 "
Rose water..... .....30 fl. oz.
Glycerine..... 2 fl. oz.

Cut up the soap small and dissolve it in about 4 ounces of water. Melt the pomade and put it in a hot mortar. Gradually add the hot soap solution, stirring until thoroughly mixed, then slowly add the rest of the rose water mixed with the glycerine. Keep well stirred until cool, then let stand for some hours, sti ing occasionally. Properly manipulated, a perfect emulsion is obtained. When completed it may be perfumed as desired. The soap employed should be of good quality.

(6244) F. A. writes: Referring to query 6203, in your issue of September 1, 1894, of SCIENTIFIC AMERICAN: 1. What is the E.M.F. of the sulphate of mercury battery described in query as above? A. About 1¼ volts. 2. How does the resistance and capacity for work compare with same size of bichromate of potash cell? A. It is not used for heavy work. 3. Does the battery run down on open circuit? A. It maintains itself very well.

(6245) A. N. M. asks: 1. What size storage battery would be required to run a 4 horse power electric motor 6 hours? A. Allowing 7 square feet of positive plate per cell, 40 cells would be required. 2. And how many 6×8 gravity cells would be required to charge storage nattery? A. A prohibitive number. The minimum would be 100, and 10,000 would be none too many.

(6246) S. E. G. says: What causes the disease on fruit trees called "black knot," also the treatment for it? A. Answer by the Department of Agricul-