RECENTLY PATENTED INVENTIONS.

Engineering.

BEATING ENGINE.—William H. Ethell, Dayton, Ohio. This is a paper-making machine for thoroughly and unformly beating the stock to a proper consistency in a very short time. The tank has a midfeather forming two compartments, one with a channel at or near the middle of the bottom, and beating rollers are secured in a shaft journaled in the tank on opposite sides of the midfeather, one of the beating rollers being located above the channel. Bed plates are arranged under the beating rollers, and a back plate is arranged in front of the roller located over the channel, while a second back fall is arranged in the rear of the other roller.

BOILER.—Thomas A. Myers, Mendon, N. Y. This improvement comprises a front and rear head made ring-shaped and connected with each other by pipes, while an inner head is arranged within and connected with some of the pipes, and it is located a suitable distance from the front head to form a fire box with the latter, the inner head being provided with pipes extending into the opening of the rear head. A steam drum arranged above is connected with all the pipes. The shell is preferably made of alternate layers of sheet metal, asbestos, and wire netting, so that all the heat generated will be retained to heat the water passing through the pipes.

HORIZONTAL COKE OVEN.—Franz J. Collin, Dortmund, Germany. This improvement is designed to facilitate a very hot working of the ovens, rendering it possible to coke bituminous coal and coal containing small quantities of gas and incapable of satisfactory baking. The oven comprises a series of juxtaposed horizontal chambers or ovens in which the passages for the gas and the heating channels are so arranged that the escaping gases can be used for heating the boilers, and the extraction of products can be effected in the most simple manner. The arrangement is such that a freshly charged oven is heated by the heat evolved in an adjacent oven, the two adjacent ovens being never emptied in immediate succession, and the production of gas and coke being continuous.

CAISSON FOR SHIPS.—Costello N. Holford, Washington, D. C. According to this improvement the hull of the vessel is provided with rows of screw bolts extending from the keel to the water line, to which may be secured detachable ribs having a contour to snugly fit the vertical sides of the vessel, a horizontal rib joining the vertical ribs at the keel, while means are provided for detachably connecting a cap plate or housing. It is designed by this means to render the whole of the hull, from the keel to the water line, accessible in separate sections, for cleaning, repainting, or repairing without necessitating the putting of the ship into dry dock.

MARINE VESSEL.—Sebastien Lacavalerie, Caracas, Venezuela. This is a vessel adapted to be propelled either on or beneath the surface of the water. It is cigar-shaped, and at its bow end terminates in a small cone and at its stern in a larger cone, both cones being independent of the body portion, and the stern cone forming a compartment large enough to contain rudder-working apparatus and afford a lookout. The propeller comprises a series of spiral flanges and their supporting rings encircling and extending the full length of the hull, the rings serving as braces and turning loosely on the hull, and the driving shaft being arranged longitudinally in the bow of the vessel, with a head at its forward end to retain it in the bow cone. The vessel is provided with air tanks in which air is held under pressure for breathing purposes when the vessel is submerged.

Railway Appliances.

CAR FENDER.—Robert Thomson, Brooklyn, N. Y. This is an improvement upon a formerly patented invention of the same inventor of a fender with an elastic cushion at the front, and covered with a yielding netting, the frame being hung from standards detachably connected with the end of the car. The improvement provides for the fender being conveniently slid on the car, either beneath the body or the platform, and being automatically locked when adjusted. A portion of the yielding covering of the fender frame is also so constructed that it may be folded flat on the main portion of the covering or be elevated to act as a guard to prevent a falling body passing rearwardly over it, the buffer cushion being also of novel character, durable, and inexpensive to produce.

CAR FENDER.—Otto A. Wicke and Philip Reinhart, Brooklyn, N. Y. According to this improvement there are parallel brackets beneath the car and eyes suspended from its front end, a sliding fender having turned-up braces sliding on the brackets, and brackets on the fender top engaging the eyes. The device is easily applied to an ordinary car, and may be readily pushed back beneath the car or extended forward ready for use, when it will trip and catch a person on the track in front of the car. A soft spring buffer covers the dashboard, preventing any injury to a person caught by the fender.

STATION INDICATOR.—William F. Prendergast, New York City. Two movable aprons are, according to this invention, adapted to display the name of the same station at opposite faces of a casing fastened in the middle of a car, so that it will be conveniently visible from all parts of the car, the aprons being moved by sets of drums geared together and intermediate mechanism, on the turning of a crank arm by one of the trainmen. The names of all the stations on the route are printed in order on both aprons, and they are thus shifted simultaneously while traveling in a forward direction, and simultaneously turned backward as the train travels in a reverse direction over the route.

DUMPING CAR.—Mexico Van Pelt, Moundsville, West Va. This car has a tilting platform which may be readily pushed to either side, to dump the dirt or other material on one or the other side of the track, without necessitating the uncoupling of the cars. The lower platform has stops at the edges and transverse vertical guides, while the upper platform has a transverse sliding connection with the main platform and pendent transverse guide members adapted to engage the guides in the main platform, stay chain devices connecting the platforms.

Mining, Etc.

CONCENTRATING ORES.—Walter J. Hammond, London, England, and John Gordon, Rio Janeiro, Brazil. This is an improvement on a formerly patented invention of the same inventors, providing a superior apparatus for separating lighter and heavier particles of ore and other substances in the same manner as is now done by a skilled hand in "panning." By the improvement a simple mechanism is made to impart to a conical vessel a varying motion around a fixed center, and an oscillating motion, eccentric to the center of reciprocal motion, around its own center, the different velocities allowing substances of different weights to come to rest or continue in suspension for purposes of separation. The apparatus is principally designed for separating gold from gravel and sulphurets from quartz, but apatite or phosphate of lime may likewise be separated from heavier material.

Mechanical.

COMBINATION PLANE.—Jacob W. Tripp, Salt Lake City, Utah. This invention consists principally of a stock adapted to receive a removable wooden sole piece shaped to conform to the curved or straight surface to be planed, a bit having gear teeth being engaged by a segmental lever for shifting the bit into proper position, and there being an auxiliary guide stock pivoted on an adjustable arm held on the main stock. The plane is of simple and durable construction, and it is arranged for universal adjustment, to enable the operator to conveniently plane straight or curved work, such as stair rails on all sides, and for moulding, fitting, plowing, tonguing, rabbeting, etc.

HAND CRIMPING TOOL.—John Wood, Long Island City, N. Y. This is a strong and simple tool for quickly and firmly crimping a cap on the flaring mouth of an oil can or other receptacle. It consists of a stock on which is held a disk, levers being pivoted on the stock which have handles at their upper ends and crimping rolls journaled on their ower ends adjacent to the edges of the disk. The disk serves as an anvil to properly permit the three crimping rolls to crimp the flange in under the flaring mouth of the spout.

HOD HOISTING MACHINE.—Gustaf P. Wern, Brooklyn, N. Y. In this machine a stay shaft on which is a spacing sleeve connects the upper ends of the standards, chain wheels turning on bearings of the sleeve, and there being friction rolls between the wheel hubs and the bearings. The hoisting wheel consists of two parallel chain wheels and a driving sprocket wheel at the outer side of one of the chain wheels, bolts on which are tubes or spacing sleeves extending through all the wheels and connecting them. The friction is reduced to a minimum by the employment of friction rolls in the bearings, and the machine is very strong and durable, the individual parts not being liable to be thrown out of alignment under the heaviest strains.

Agricultural.

HARVESTER ATTACHMENT.—Charles Stucke, Appleton, Minn. According to this improvement, gathering pans or screens underlie the platform and elevator aprons and the binding table, in combination with troughs, spiral conveyors and elevator chain, to gather any shelled grain falling out and convey it to a bagging device. The attachment is designed to save the shelled grain which may become incidentally thrashed out in the operation of cutting, elevating and binding it into sheaves, and which ordinarily falls to the ground and is wasted.

SHOVEL PLOW.—William F. Hartig, Evansville, Ind. This invention relates to plows having laterally extending wings or sweep members, and the inventor has devised a construction in which the several sweep or cutter attachments can be readily attached to or detached from the standard, and can be readily adjusted to the desired vertical angles, as the condition of the hill or row may require. The plow may be used as an ordinary bull tongue plow, or it may have lister blades at each side, double cutter wings, or one cutter and one lister wing, in either adjustment, the wings being quickly and easily swung inward or outward by shifting the operating levers, or they may be swung parallel with the heel of the standards.

Miscellaneous.

APPARATUS FOR TANNING.—William T. Harrison, Pooler, Ga. This apparatus comprises sets of airtight vessels for the hides to be tanned, one set to be filled at a time with the tanning liquor, a reversing pump pumping the liquor from the filled vessel into the empty ones, and from the latter into the first vessel, while heaters are provided for heating the liquor as it is discharged from the pump to the vessels. The hides are, by this means, alternately subjected to the action of the tanning liquor and a complete vacuum. The vessels are reinforced in such a way as to make them perfectly airtight and entirely safe when the vacuum is formed.

COAL AND GAS STOVE.—Donald McDonald, Louisville, Ky. This is an improvement on a gas stove formerly patented by the same inventor, to enable it to burn coal or other solid fuel as well as gas, and at the same time. The invention consists chiefly in the combination of a gas burner, a solid fuel grate or basket, and a supplemental grate which may be adjusted to cover and protect the gas burner and asbestos lining, when coal is used, or may be thrown back to expose the gas burner and give it full effectiveness when gas alone is used. The improvement affords a very cleanly, quick and desirable method of igniting coal and starting a fire without kindling wood.

STEAMER AND BAKER.—Burchard T. Kuhl, Orlando, Fla. This is a cheap and simple apparatus which may be used over a lamp. It has a lower steaming compartment adapted for use in steaming food or making jelly, preserves, etc., and an upper oven for baking, the oven being so arranged that it may be converted into a steaming chamber if desired. All the parts are readily accessible and the joints are closed by a water seal, so that the flavor of the things cooked may be retained and the odor will not escape into the room. Articles contained within it may be kept hot with very little heat.

DISCOUNT WHEEL.—James G. Huffman, Decatur, Ill. This is a wheel to be revolved by the dropping of a coin in a slot, the wheel stopping at places which cannot be previously determined and pointing out certain discounts to be made to the person operating it. The machine is of simple construction and attractive in appearance. The coins which work the wheel are dropped into a till, and the wheel is designed to afford amusement with the attractiveness of speculation.

FILLING MACHINE.—John F. Wolven, St. Clair, Mich. For filling simultaneously a large number of vessels with a liquid, as the filling of bottles or communion cups for church services. this inventor has devised a machine comprising a reservoir with funnels and elastic valves with upwardly extending rods, each valve rod being connected with one of a series of arms extending from shafts journaled in suitable bearings, there being a handle by which all the shafts may be given a swinging motion to open and close the valves.

PUMP PIN.—James W. Mapps, York, Neb. This is a pin especially adapted for connecting the pump rod to a windmill. It has a body section and a drop section, the latter being shorter than the body section, and when the body section is employed as a pump pin it is provided with a head. The head is not needed when the pin is employed as a horizontal clevis for plows, or similar purposes, the head end of the body being then threaded to receive a nut.

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.

SCIENTIFIC AMERICAN BUILDING EDITION.

MAY, 1895.—(No. 115.)

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Notes & Queries

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(6528) W. E. B. says: Can you give me any information as to how the fine crocus finish, such as put on razors and fine pocket cutlery, is accomplished? A. For hollow finishing, the following wheels are required: A mahogany wheel for rough glazing. A mahogany wheel for smooth glazing. A lead wheel or lap. For flat finishing: A buff wheel for rough. A buff wheel for smooth. A buff wheel for finishing. Lastly, a polisher. To make the glaze wheels: Get the spindles, and point them on each end; then get a block of beech and wedge it on the steel at one end with iron wedges; and turn it for the pulley for the band to run on. Take two pieces of flat mahogany and glue and screw them together, so that the grain of one piece crosses the other to prevent warping. Let it get thoroughly dry, and wedge it on the spindle and turn it true. The lead wheel is made the same way, but wider, and has a groove turned in the edge. The wheel is put into sand, and a ring of lead run round the edge; it is then turned true. To make the buff wheels, proceed as with the glaze; but to save expense, pine or deal wood will do as well as mahogany, only leave it about double the width of the glaze, which is about ½ inch wide by 12 or 14 inches across. The buff wheels are covered with glue, and then the leather is tacked on with tacks driven in about half way, so that they may be easily drawn out again. The leather is then turned true. The polisher is made the same way, but the size of the polisher must be a little less than any of the other wheels, say about 1 inch. The buff wheels are dressed by laying on a fine thin coat of clear glue, and rolling them round—No. 1, in superfine corn emery; No. 2, in smooth emery; No. 3, by making a cake of equal parts of mutton suet, beeswax, and washed emery; then it is held on the wheel while it is going round. The glaze wheels are dressed while using, by mixing a little of the emery with oil, and putting it on the wheel with a stick or the finger. The leather of the polisher is not covered with glue, but dressed with a mixture of crocus and water, not oil. Care must be taken to keep each wheel and substance to themselves; the work must be carefully wiped after each operation, and cleanliness must be studied above all things in using the polisher, as the slightest grease getting on it stops the polishing.

(6529) J. M. asks: 1. Is perspiration weakening? A. No; unless accompanied by disease. 2. What is the difference between a rapid rectilinear and a single view lens? A. A rapid rectilinear is what its name indicates. A single view may not be rapid. It always distorts the image, especially near the margin. 3. Will a square tube with a square cut prism answer as well as the round tube for the spectroscope, No. 672? A. Yes. 4. What size lens should I use to take a common size cabinet portrait? A. Use the size given by reputable makers. If it is only a question of taking the image without regard to other considerations, any convex lens will take an image. You will be sure of good results only with good lenses made for the particular kind of work to be done. 5. How can I prepare my own dry plates? A. We cannot give the information in the space at our command. Consult SUPPLEMENT, Nos. 647, 649, 696, 541, 374, 340, 299, 272, or Sinclair's "Dry Plate Making," which we can mail you for 50 cents.

(6530) F. W. L. says: 1. How can I make a cement for the splices of a leather belt? A. Take of common glue and American isinglass, equal parts; place them in a boiler, and add water sufficient to just cover the whole. Let it soak ten hours, then bring the whole to a boiling heat, and add pure tannin until

the whole becomes ropy or appears like the white of eggs. Apply it warm. Buff the grain off the leather where it is to be cemented; rub the joint surfaces solidly together, let it dry a few hours, and it is ready for practical use; and if properly put together, it will not need riveting, as the cement is nearly of the same nature as the leather itself. 2. Also a good dressing for same kind of belt? A. Five parts of India rubber are cut fine and melted together with 5 parts of oil of turpentine in an iron, well covered vessel; then add 4 parts of resin, stir well, melt, and add 4 parts of yellow wax, stirring constantly while melting. This mixture while warm is added with constant stirring to a melted mixture of 15 parts fish oil and 5 parts of tallow, and the whole is agitated until it has congealed. The mass is applied to old belts upon both sides in a warm place, and when the belts are in use, from time to time upon the inner side. By this treatment they become very durable. 3. Is it injurious to any kind of dynamo to run for any considerable length of time with any lamps or motors in circuit with it? A. No; unless it becomes unduly heated. 4. How can I find the horse power of a common slide valve engine? A. Multiply the square of the diameter of the cylinder in inches by 0·7854, and this product by the mean engine pressure, and the last product by the piston travel in feet per minute. Divide the last product by 33,000 for the indicated horse power. In the absence of logarithmic formulæ or expansion table, multiply the boiler pressure for ⅝ cut-off by 0·91; for ½ cut-off by 0·85; ⅜ cut-off by 0·75; 3-10 cut-off by 0·68. This will give the mean engine pressure per square inch near enough for ordinary practice, for steam pressures between 60 and 100 pounds, always remembering that the piston travel is twice the stroke multiplied by the number of revolutions per minute. 5. What is metallic packing? Is it applicable to the stuffing box of engine? A. Metallic packing is used for steam engine piston rods. It is made in metal rings or mixed with other packing. 6. What is the lubricant for commutators? A. Use a small quantity of oil.

(6531) W. H. M. asks: 1. If the rear sprocket of a bicycle were 6 inches in diameter and the front one in proportion, would it run easier than if made the usual size? A. Possibly. We understand that the principle is now being tried on some French bicycles. 2. If a bicycle had a chain on each side, would it run with less friction than with single chain. A. Data are wanting to determine this. It is so much trouble to keep one chain in order that we should be very slow to introduce a second one.

(6532) F. F. asks: What is the temperature of the bottom sheets of a tubular boiler on the side next to the fire when the boiler is forced to its full capacity? Also what is the temperature on the water side of same? The above question came up at a meeting of our association; one member claimed that it was 1,100 degrees on the side next to fire. Some said he was right, others said he was not, so to settle the matter it was left for you to decide for us. A. The temperature of the water side of fire sheets is but little above the temperature of the water when making steam, probably 150 to 200 degrees. The iron is a quick transmitter of heat, and although the fire against the fire sheet may be 1,400 to 1,600 degrees, the surface of the plate is seldom above 600 degrees.

(6533) R. A. C. writes: I have made motor No. 641, and it works so well that I write you to let you know how I made it. I have provided a bronze bar commutator and a cast field; the field is mounted to stand erect, and the bearings are made of brass and screwed to the poles. I have also made a dynamo like the eight light dynamo except it is two-thirds size, and it runs the above motor nicely.

(6534) J. J. D., Kan., writes: The inner sides of the steam chest of an engine we have are being continually eaten away. The metal becomes so soft that it can be easily cut into with a knife. We can't see any reason for it unless it be that some acid gets mixed up with the steam. But we do not know where it comes from. We use ordinary rain water in the boiler. To prevent leakage between joints the steam chest is packed with asbestos paper. Could the acid come from this, owing to the way the fiber may have been treated? As the chest has been thoroughly cleaned lately, we have no means of examining at present the product formed. If you could tell the real cause and suggest a remedy, you would greatly oblige us. A. The water from the condensing steam on the inner surface of the steam chest is an absorbent of iron and is known to disintegrate and carry away the iron, leaving the graphitic carbon in place, and in a condition to be cut away with a knife. This is notably so with very soft castings, which contain a large percentage of carbon. There is only a partial remedy in the making of engine parts that are in contact with steam to have the iron low in carbon. By cutting off a portion of the soft surface and testing, you will find it characteristic of ordinary graphite.

(6535) J. M. C. asks how to distinguish between gold and its imitations, either plated articles or alloys. A. An assay or analysis is the only good method. The following may answer for rough tests: Gold should dissolve in a mixture of one part nitric with three parts hydrochloric acid. A residue indicates silver. If sulphuric acid is added to the solution, a precipitate indicates lead. One quick method is to determine its specific gravity. Silver may be dissolved in nitric acid. It should, with excess of ammonia, give a colorless, clear solution. Sulphuric acid may be used to test for lead.

(6536) G. W. W. says: Will you kindly republish the formula for your buffalo moth exterminator? It did its work in a thorough manner, but I have carelessly mislaid your formula and would greatly appreciate its republication. A. Take strips of red or blue flannel, as these colors are particularly attractive to them, dip in solution of arsenic and lay around the edges of carpets or wherever the pests are troublesome.

(6537) T. Y. C. says: Please give me in the SCIENTIFIC AMERICAN a recipe for an elastic waterproof glue. A. Glue which stands moisture without softening. Dissolve in 8 fl. oz. of strong methylated spirit ½ ounce each of sandarac and mastic; next add ½ ounce of turpentine. This solution is then added to a hot, thick solution of glue, to which isinglass has been added, and is next filtered while hot through cloth or a sieve

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