ENGINEERING INVENTIONS.

An improvement in journals and other bearings has been patented by Mr. Ferdinand E. Canda, of New York city. It has for its object the production of an improved anti-friction material for journals and other moving parts of machinery, which consists of the pulverization of any of the metals which amalgamate with mercury. The inventor heats the mass to a sufficient degree (say 280° Fahr.), when the whole forms a plastic mass which he casts into moulds of the shape of the bearing to be produced, adding pressure to give it form and expel the superfluous mercury. It soon hardens, when it is ready for use.

Mr. Levi H. Roberts, of Paris, Ill., has patented an improved journal box. The object of the invention is to provide a practical anti-friction journal or axle box for railroad car and other axles; and it consists principally of journaling two anti-friction wheels or rollers in and between two boxes; these are coupled together and adapted to be placed upon the journal portion of the axle, with the anti-friction wheels or rollers resting upon the axle and supporting the weight of the car. The invention also consists of oil boxes for the journals of the anti-friction wheels, of the means for coupling the front and rear boxes together, and of journal blocks to fit in the front and rear boxes upon the journals of the anti-friction wheels. It is claimed that by this invention the capacity of the motive power is increased, and the danger from boxes becoming heated is obviated.

An improved mining auger has been patented by Mr. William N. Talley, of Hampton, W. Va. The invention consists of an auger and threaded shaft mounted in a screw threaded supporting nut, which nut is made in two parts, so that it may be taken apart and reset for beginning a new bore, and these are held together by a pivoted S-shaped button, which passes into nicks in stud pins designed to receive it. The nut for holding the auger is mounted on uprights with a pointed head piece to be set against the roof of the mine, and jackscrew to rest in a cavity in the floor. The nut is held in position by clamps which fit into recesses prepared for them in the supporting bars. In this way the auger is readily detached from the frame, in order that the auger bore may be cleaned without the frame being taken down from its position.

An improved stock car, in which the animals may be easily and rapidly fed, and in which they may be transported without being subjected to the inclemencies of the weather, has been patented by Messrs. Henry R. Bothwell and James H. Strugnell, of Toronto, Canada. The invention consists in chains attached to the opposite standards of the car, and provided with chains which are attached to adjoining transverse chains for forming supports under the bellies of the animals to prevent them from lying down, but on which they can rest. Combined with manger bars are a series of hooks on the standards and on the walls of the hay boxes, for the purpose of facilitating the adjustment of the mangers to the size of the animals. A diagonal bar is attached to the ceiling of the car and to one of the sides, and a piece of canvas is attached to it, and also to the ceiling and side of the car, which forms a partition at the head end of the stalls. Hay and water boxes are arranged on top of the car, and are provided with proper outlets at the bottom by which the animals are fed and watered.

An improved device for applying the brakes to railroad cars has been patented by Mr. Charles Van Dusen, of New Albany, Ind. The invention consists of a cylindrical reservoir suspended beneath the tender or in any convenient place, divided into two compartments by a horizontal partition, the lower compartment being partially filled with water; steam being introduced into this from the engine by a pipe which is provided with a stop cock, and with a valve for permitting the water to escape when it rises above a certain point in the chamber. The only connection between the upper and lower compartment is by a large pipe, which is provided with a float by means of which the water is prevented from rising above the neck of the pipe and passing into the upper chamber when the pressure is being applied to the water in the lower chamber by the steam from the engine. The air is compressed by the rising of the water in this pipe; a reservoir is suspended near this for a reserve supply, but this is not absolutely necessary. The air is conducted from these reservoirs by means of proper hose and connecting pipes to the braking apparatus on the car, passing into a chamber provided with a piston working vertically and connected with a cam lever arrangement by which means, when the pressure is applied, the toe of the cam is elevated and the friction wheel is brought against the inner surface of the car wheel. This air brake arrangement is very simple in its construction, and is intended to be entirely under the control of the engineer.

MECHANICAL INVENTIONS.

Mr. Joseph H. Hunter, of Adair, Ill., has patented an improved water elevator. The invention consists of a combination of pawl and ratchet wheels, by which are set in motion angular buckets attached to metallic plates which are hinged one to another, forming an endless chain, and passing over a wheel provided with forked arms, by means of which contrivance the water is elevated and discharged.

Mr. Henry Cutler, of North Wilbraham, Mass., has patented an improved grain drier, whose object is to provide driers of large capacity, in which the temperature can be raised to a high point without any injury by expansion and contraction, to the machine, or the liability of breaking joints, and consequent leaking. This invention is an improvement on a machine for the same purpose patented by Mr. Cutler on September 20, 1881.

Messrs. James Kneen, 2d, of Birmingham, and Wellington M. Reed, of Huntington, Conn., have patented an improved escapement mechanism for watches. This invention relates to the ruby pin tables of watches, with the object to allow adjustment of the tables and hair spring of the balance wheels without removal, as is required when the wheel and table are attached permanently to the pivot shaft. The parts can be readily adjusted in relation to each other on the staff.

An improved hand vise for brooch pins has been patented by Mr. Myer Moss, of Yarmouth, Nova Scotia, Canada. This invention relates to a tool used by jewelers in repairing brooches and similar small articles. The tool is provided with jaws to grip and hold the article to be mended, with a series of graduations for regulating the required length of the joint of the brooch being repaired.

A novel hand truck, the object of which is to provide means for preventing backward movement of hand trucks while the load is being placed upon them, has been patented by Mr. George P. Clark, of Windsor Locks, Conn. The invention consists of a spring-actuated holder or clamp placed upon the shaft or axle of the truck, which is adapted to be pressed down by the foot of the user to engage with the floor while the box, barrel, or other load is being placed upon the truck.

A novel circular sawing machine has been patented by Mr. Christian J. Steinbach, of St. Louis, Mo. The invention relates to cut-off sawing machines in which the saws are made to move while cutting, instead of the wood. In this machine a single saw slide and belt are made to work two saws instead of one. The invention also consists of an improved arrangement of the gear for reciprocating the saw slide, an automatic apparatus for discharging the pieces sawed off, and an adjustable gauge stop.

Mr. Aaron Emerick, of Johnsburg, Pa., has patented an improved shingle sawing machine. This invention consists of a shingle sawing machine having a carriage provided with an automatically operating gauge for the bolt. This gauge is so constructed that by a slight movement of the bolt the butts of the shingle may be formed alternately at opposite ends of the bolt. The arrangement of the mechanism is such as to allow the shingle to drop with ease as soon as severed from the bolt.

An improved draughting instrument has been patented by Mr. Henry C. Root, of San Francisco, Cal. This invention consists in an instrument for determining the lines and bevels of circular stair rails, for determining the lines and bevels for jack rafters in hipped roofs, and other purposes of a similar nature, the object being to determine the angle subtended by the tangents and the pitches or bevels which are in the same plane. For architects and builders this instrument, which is denominated a tangentograph, would seem to be highly useful.

A new washing machine, an improvement upon that class of washing machines having a slotted or perforated revolving cylinder for containing the clothes, which rotates in a box containing the water, has been patented by Mr. William Bruen Smith, of Clayton, Ill. The chief feature of the improvement is the clothes rubber and presser suspended so as to swing freely within the cylinder. The revolving movement causes the clothes to rotate in contact with both the rubber and periphery of the cylinder, and the water being kept in motion thus washes and rinses the clothes in the shortest possible time.

An improved boiler and furnace, the object of which is to economize space and fuel in the construction and use of boilers and furnaces, has been patented by Mr. James H. Mackintosh, of Paterson, N. J. The invention consists in a boiler and furnace constructed with three concentric annular water chambers connected by pipes, divided into compartments by partitions, and having enlarged lower ends. The water chambers are supported upon a base, are inclosed with a casing, and are provided with a central coal reservoir and two fire pots. The boiler is so constructed that the water is caused to circulate in thin sheets, and, exposed to the heating surface on both sides, insures rapidity in the heating of the water.

A novel fire escape has been patented by Mr. Charles Roberts, of Montgomery City, Mo. The invention consists in a standard, on which is mounted a platform and turn table frame, to which ladders are attached, which platform carries a windlass for raising the ladders. The ladders can be raised by means of the windlass, and are held in position by ropes. The platform and the frame can be turned on the standard, the ladders being balanced by the overhanging part of the frame. After the ladders have been erected they can be swung into any desired position by turning the platform. Ladders of any desired height can thus be raised very rapidly, and can be moved from one place to another very easily.

A pump of improved construction has been patented by Mr. Jesse A. Heydrick, of Barnhart's Mills, Pa. The invention consists in a rotary vertical cylinder attached to the lower end of a rotary stand pipe, which cylinder contains a reciprocating piston provided with downwardly projecting shanks or prongs resting on spiral tracks, whereby the piston will be reciprocated and water raised when the pump tube and the cylinder are rotated. The piston is provided with a perforated pipe within a larger perforated pipe connected with the spiral tracks. The invention further consists in an inverted cylindrical cup attached to the upper end of the stand pipe, into which cup is a tubular projection which forms part of a vessel surrounding the inverted cup.

An improved spindle and bearing therefor have been patented by Messrs. George B. McCracken and Samuel Hamer, of Willimantic Conn. The invention relates to that class of spindles in which the bobbin is held steady at the top by a short spindle and turned by a whirl placed on a central stud, whereby the bobbin is made to run easy, steady, and true, the bearings properly oiled without retarding the motion of the spindle or soiling the bobbin. The oil may be used over and over again. The spindle may be easily taken apart for cleaning and the wearing parts replaced with ease and small expense. The bobbin being held at the top and bottom only, prevents friction, and enables the spindle to run very lightly and steadily.

A machine for grading coffee according to the size of the berries, and at the same time to free the coffee from sticks, stones, sand, and other impurities mixed with it, has been patented by Mr. Elam Rakestraw, of Cambridgeport, Mass. The invention consists in a reciprocating screen shoe combined with a box with a curved surface, upon which the coffee drops from the screen shoe, and in passing is exposed to a powerful current of air, which blows the light coffee over swinging wings into suitable receptacles. The heavy coffee and stones drop upon the wings and slide down into a chute, and from the chute into an elevator, which raises them to a hopper, so that they pass through the screen shoe a second time, and perfect the separation.

A new apparatus for making salt, the object of which is to provide an improved concentration of brine, has been patented by Mr. Clemens von Bechtolsheim, of Munich, Germany. The invention consists in the arrangement with a brine boiler of a device for receiving brine from the boiler, and two evaporating pans. One of the pans is connected with the boiler and a pumping engine in such a manner that the steam from the pan, which is heated by direct flames, can be used to heat the brine in the boiler and to work the pumping engine. From the boiler the brine passes into the dome, and is then pumped into the two pans. The steam from the dome is utilized to heat one of the pans. The main object of the invention is to economize fuel.

An ingenious post hole boring machine has been patented by Messrs. William Graham and William H. Staley, of London, Ohio. The machine is designed for boring holes, say six, seven, or eight feet apart, according to the length of the boards to be used; but it may be constructed to be adjusted for any distances within practical limits. The augers are secured to a frame one at each end, with the driving mechanism which consists of an ordinary horse power arrangement placed in the center of the frame midway between the two augers. The master driving wheel meshes into the gearing attached to the two augers, and when the large wheel is propelled by horses attached to the sweep, both of the augers are operated at the same time.

An improved foot power mechanism applicable to bicycles, sewing machines, lathes, and similar machines, in which foot power is employed, has been patented by Mr. Anson F. Fisher, of Chico, Cal. The invention consists in a horizontally swinging treadle connected with a pawl carrier, which in turn is connected with a ratchet wheel, the latter being located at the axle of the working wheel and joined to it, so that when the treadle is pushed forward, the pawl carrier is likewise pushed forward to the ratchet wheel, which sets the whole mechanism in motion. The treadle is brought back in place by a spiral spring, one end of which is attached to the propelling shaft, and the other end to the forked standard of the bicycle, and thus a rotary motion is kept up.

AGRICULTURAL INVENTIONS.

An improved cultivator, the object of which is to remove the vines from between the rows of sweet potatoes, and lay them on the ridges of the rows without injury to the vines, and at the same time cultivate the spaces between the potato rows, has been patented by Mr. Bernhart Kemper, of Muscatine, Ia.

An improved protector for hay and grain stacks, to prevent the top from being blown away and protect them from rain, has been patented by Mr. George G. Matthews, of Wichita, Kan. The invention consists in a protector for hay and grain stacks constructed with a board having longitudinal drain grooves along its upper surface. A narrow top board is secured to it for clamping the overlapped ends of the thatching material. To the lower side of the base board are hinged tapered stakes with teeth for securing the protector firmly to the stack.

An improved cultivator has been patented by Mr. William H. Luce, of Prairie Centre, Ill. The frame of the machine consists of a cross beam mounted on wheels, and supported by side braces, from the rear extremities of which depend the plowshares, so adjusted that their proximity one to the other is regulated by a very simple mechanism. The depth which the plows are to work is determined by a curved connecting bar which is attached to the pole or tongue of the vehicle, and passing through a slotted post is held in any desired position. A lever connected to the after part of the machine is operated by the driver, by which he is enabled to alter the pitch of the machine.

An improved corn planter, designed to facilitate the planting of corn and also to promote convenience in guiding the machine parallel with the row last planted, has been patented by Mr. John R. Owen, of Pulaski, Tenn. Attached to the axle of the wheel at the middle and rotatable with it, is placed a cylindrical box with two chambers cut in it, of a size suitable to hold enough corn for one hill, these chambers being placed immediately opposite one another, and thus emptying their contents at every half revolution of the wheel. Above the cylinder is placed the supply box. The seed is planted and covered, and the mound formed by plows located at the rear of the vehicle, and a horizontal bar to assist the eye in the guiding of the machine is provided, so that every row is equally separated from every other row, and the whole field uniformly planted.

MISCELLANEOUS INVENTIONS.

A novel sand band adapted to be applied to thimble skein axles has been patented by Mr. Delos M. White, of Hudson, Wis. The invention consists of a collar divided into equal or nearly equal parts, and of a dust chamber and of flanges and belts so related as to keep the axle almost completely clean from dust and sand.

An improvement in crimping machines, where the crimping and stretching is done at the same time, has been patented by Mr. Dominick A. McDonald, of Rockland, Me. The invention consists in devices to lessen the number of times of handling the leather or substance to be crimped, and to stretch the material when desired.

A new composition for removing scale or calcareous deposits in boilers has been patented by Messrs. Charles R. Bacon and Frank Queen, of St. James, Minn. It consists of aqua calcis, or lime water, and pure sweet oil, of equal proportions. This compound mixes readily with the water in the boiler, and attacks all lime deposits alike and softens them. This compound does not remove the deposits, but softens them to such an extent that they can be washed off readily by means of a stream of water.

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Notes & Queries

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No attention will be paid to communications unless accompanied with the full name and address of the writer.

Names and addresses of correspondents will not be given to inquirers.

We renew our request that correspondents, in referring to former answers or articles, will be kind enough to name the date of the paper and the page, or the number of the question.

Correspondents whose inquiries do not appear after a reasonable time should repeat them. If not then published, they may conclude that, for good reasons, the Editor declines them.

Persons desiring special information which is purely of a personal character, and not of general interest, should remit from $1 to $5, according to the subject, as we cannot be expected to spend time and labor to obtain such information without remuneration.

Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office Price 10 cents each.

Correspondents sending samples of minerals, etc., for examination, should be careful to distinctly mark or label their specimens so as to avoid error in their identification.

(1) F. S. D. asks: How does the winding of the magnets in a magneto call bell differ from that in ordinary electro magnets? I wish to make one so that the magnets draw alternately. A The winding is the same in both cases.

(2) A. W. W. asks whether sulphurous acid can be administered to any one with bronchial catarrh. A. Sulphurous acid can be made and taken anywhere. As it is somewhat dangerous, we should recommend its use only under a physician's guidance.

(3) H. E. F. asks for a good receipt for making "treer's blacking," that which is most generally used by "treer's" in the boot and shoe manufactories. A. Dissolve gum tragacanth in water, then add a little ink to make it black, and finally add a small quantity of neatsfoot oil. It must be quite thin, or else, if thick, it is liable to cake.

(4) C. A. B. asks: We have a melting kettle of cast iron, holding about five tons of metal (lead), which has a slight crack in it, through which the molten lead finds its way. Can this be repaired, and how? A. If the crack in the melting kettle is where the fire touches it, you cannot mend it by patching with rivets, as it will not be reliable. If the crack is very small, it might be drilled out, tapped with a taper pipe thread, and plugged. If the crack is directly over the fire, this will not save the kettle. A foundryman could "burn" the crack out, if you can take out the kettle and send it to him. Otherwise you will have to procure a new kettle, which is probably advisable.

(5) T. S. C. writes: I want an anti-friction metallic piston for packing a three inch steam or water cylinder. I am using lead for the rings. Can I mix it with any other metals so as to make it harder and be elastic too? If so, please state the component parts. Can a small cylinder, as described above, be made tight with exclusive metallic ring packing? If so, please state how. A There is no way of making it perfectly tight; if the cylinder is for cold water, use a cup leather packing; for steam, you can add tin to your lead and get a harder packing. Try good Babbitt metal.

(6) G. B. M. asks why hot air can be seen coming up from a hot stove, while we cannot see the wind blow. A. The refractive power of hot air differs from that of cold air, and when in circulation, mixed with cold air, as in a column rising from a hot stove, it produces a vibratory effect upon objects seen through it. You also see particles of dust floating in the upward current, but you do not see the air itself. The circulation of air is indicated by the floating dust when a beam of sunshine enters a dark room.

(7) E. M. writes: 1. I have an engine, 4 inches bore and 6 inches stroke; I also have a boat model, built 21 feet long by 5 feet beam, 2 feet in depth, draught of water, 18 inches, including 6 inches keel; can also get 14-inch propeller wheel. Will this be large enough, or too large? A. Your wheel should be 18 inches diameter. 2. Will this run her direct-acting frame engine to wheel? A. Yes. 3. What speed upstream will she make, current three miles an hour? A. Speed depends on power applied; probably not more than 3½ to 4½ miles. 4. How many revolutions a minute will the engine be required to make. A. 360 to 400 revolutions per minute. 5 What sized boiler will it take for engine to make plenty of steam? A. 80 to 90 square feet heating surface.

(8) A. J. H. asks: 1. How much power will a 12 foot windmill generate in an ordinary wind? A. Average about 1½ horse power? 2. Will the dynamo electric maching described in SUPPLEMENT, No. 161, produce twice as much electricity if it is built twice as large? A. Yes. 3. Will you please mention the name of a good firm of which to procure cotton and silk covered copper wire. A. See our advertising columns.

(9) A. P. C. asks how to polish the blades of knives and scissors after sharpening. I have a small lathe, if that would be of any service. A. For a small lathe a buff made of two or three disks of thick sole leather, 3 inches or 4 inches diameter, placed upon a spindle of wood or iron, pressed together with nuts and washers, or glued if on wooden spindle. Turn off true, and use the finest flour emery and a little oil to hold the emery. If a higher polish is required, use tripoli or rotten stone or crocus, as you may find best by trial.

[OFFICIAL.]

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January 30, 1883,

AND EACH BEARING THAT DATE.

[Those marked (r) are reissued patents.]

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