ENGINEERING INVENTIONS.

Mr. Benjamin F. Smith, of Alabaster, Mich., has patented an improved car brake that is operated by running the cars together, the ends of rods placed under each car striking similar rods under other cars to partially rotate turn plates placed under the center of the cars. These plates when rotated draw on ropes that operate the brakes of the car. Devices are provided for shortening the rods so that when the cars are backed the brakes are not operated.

Mr. John H. Smith, of Fairchild, Wis., has patented an improved car coupling in which the coupling pin is temporarily held in an elevated position, by means of sliding support that is pressed forward by a spring placed in a longitudinal slot in the draw head. When the cars come together the coupling-link presses the sliding support back, and the pin drops through the link, coupling the cars.

Mr. Edward B. Meatyard, of Geneva, Wis., has patented an improved car wheel in which the tire is formed with an internal annular web, serving to strengthen it, and to secure it to the body of the wheel The body of the wheel is composed of two circular disks, centrally apertured, and thickened around the aperture to form a hub. From the hub outward, the disks are curved and formed with radial slots, and at the outer edges are riveted to the web of the tire.

Mr. Arthur Codd, of Bowmanville, Can., has patented improved devices for braking a train of cars from the locomotive. Rods provided with buffers at their outer ends are placed longitudinally under the cars and the tender of the locomotive, these rods being connected by chains and pulleys to the brake bars of the cars. One end of the rod under the tender is attached to the piston of an air or steam cylinder, which when it is moved pushes the rods and operates the brakes of the cars.

An improved compass alidade has been patented by Mr Franklin J. Drake, of Gasport, N. Y. The alidade is mounted to swing and turn on a standard on the top of the binnacle of a mariner's compass, and is connected by a vertical rod with a pointer-frame on the compass, so that the alidade and the pointers will always be in the same vertical plane, the pointers showing the compass bearings of any object that can be viewed through the alidade.

A device for clearing snow and ice from street railway tracks has been patented by Mr. James M. Elliott, of Columbus, O. It consists in laying connected pipes underneath the rails of the railway, the rails being grooved on their under side to receive the pipes. Steam, hot air, or hot water is conducted through the pipes, heating the rails and melting the snow, etc , from the track.

METALLURGICAL INVENTION.

Improvements in furnaces for deoxidizing iron ores have been patented by Mr. Israel D. Condit, Jr., of Millburn, N. J. A flue conducts the heat from a puddling furnace or other fire into a distributing chamber extending the whole length of the deoxidizing furnace. From this chamber the heat is distributed by a series of vertical and horizontal flues, in such a manner that the retorts of the furnace will be heated upon all sides, thus heating and deoxidizing the ores evenly.

MISCELLANEOUS INVENTIONS.

Mr. William S. Plummer, of San Jose, Cal., has patented improvements in devices for heating the drying chambers of fruit evaporators. The products of combustion are made to traverse a winding course, and are thus held in such a position that their heat is absorbed by rising currents of fresh air, which enter from a register below, and pass into the drying chamber placed above the device. Mr. Plummer has also patented improvements in the drying chambers of evaporators, by which the heat from the heating device is divided and so distributed as to heat the chamber evenly in all its parts.

Mr. Nestor R. Alpuche, of Merida, Mexico, has patented a novel centrifugal pump consisting of a tube, having its lower end hinged to a block below the surface of the water, and open to admit the water. Its upper end is attached to a crank wheel, by which it is caused to oscillate, raising and throwing out the water by centrifugal action. A valve is placed in the bottom of the tube to retain the water while the crank is passing its centers.

An improved hand bag frame has been patented by Mr. Henry S. Crans, of Brooklyn, N. Y. The bag frame is of the usual construction, and is provided with a spring fastening at the center of the handles. To the outer end of the stem of the fastening, is hinged a rod that has at its outer end a loop through which the handle of the bag passes. By pressing the rod the fastening and bag are opened.

Improvements in slop safes for water-closets have been patented by Mr. Joseph B. Frey, of New York city. The safe is of the ordinary shape, and the improvement consists in providing it with a flushing rim, or sprinkler, for washing the surface of the safe with fresh water, removing all objectionable odors. The safe is adapted to be applied as a separate structure to any ordinary bowl.

Mr. Sylvester Huff, of Wabash, Ind., has patented an improved car coupling. At each end of the car an arrow head coupling bar swings vertically, passing through a guide frame on the end of the platform, and is pivoted to a cross piece on the under side of the same. Links attached to each of the coupling bars are connected at their upper ends to bell crank levers, pivoted on the top of the platforms, the inner shank of the levers being provided with handles for raising and lowering the coupling bars

Mr. Emile M. E. E. Thorey, of Union Hill, N. J., has patented improvements in cocks, in which the plug is held closely to the socket and yet turns easily. The plug of the cock has the usual opening for the passage of the fluid, and is made hollow. A head provided with a hook on its under side, rests loosely in the top of the plug, and a similar head rests in the bottom of the socket. The heads are connected by a spiral spring, thus holding the plug to the socket in such a manner that it can be easily turned.

Mr. Solomon Kuhlman, of Canton, O., has patented a gauge for regulating the depth to which holes are to be bored by an auger. A clamp holding a gauge rod is so adjusted on the shank of the auger that the lower end of the rod will be from the lower end of the auger a distance equal to the desired depth of the hole to be bored. When the hole has the desired depth the lower end of the gauge comes in contact with the surface of the wood and prevents a further penetration.

Mr. Watson F. Lamb, of Brooklyn, N. Y., has patented improvements in adjustable easels. The standard of the easel is adjustably secured to a pedestal having a cross bar and a roller. The work supporting frame is connected with the cross bar of the standard by a pair of hinged bars, and with the roller by a pair of hinged sliding bars, the bars being slotted longitudinally to receive a rod on which is placed a lever cam that clamps and holds the parts in position.

An apparatus for indicating the time of arrival and departure of trains has been patented by Mr. Joseph C. McKenzie, of Beaver Falls, Pa. A clock dial is provided at its edge with a rim to which adjustable tablets are attached indicating the time of the train. An index hand moved by clock mechanism comes in direct line with the tablets when the trains are due. If the hand has passed the tablet it shows how much the overdue trains are late.

A valve suitable for water tanks has been patented by Mr. Max Miller, of Brooklyn, N. Y. It consists in a spring strip attached to the inner surface of the tank, having a packing layer or disk attached to its inner surface, and covering the spout. A wire attached to the disk projects through the spout. By pressing on the wire the spring strip and disk is raised, and the water flows through the spout.

Improvements in apparatus for hanging, drying, and delivering wall paper from the printing machines have been patented by Mr. William J. Palmer, of Flushing, N. Y. The paper as it comes from the machine is received upon rods, and hangs from them in festoons. The rods are secured to an endless chain or belt, that is moved by suitable devices, and carries the paper through the drying room, and delivers it automatically to a reel to be wound in the usual manner.

A machine for addressing newspapers, etc., has been patented by Mr. Martin M. Morrison, of Kansas City, Mo. Each address is formed upon a separate type block, made of rubber or other elastic material. The blocks are secured separately, side by side, on an endless movable belt. The belt is arranged with such devices that when a type block is pressed down a new block is brought into position for printing.

An improvement in wheel-barrows, by which they are adapted to be easily knocked down for transportation, and are strengthened and made more durable, has been patented by Mr. Stephen L. Rockwell, of Jordan, N. Y. The front and rear legs of the barrow converge at their lower ends and are united to each other by a lap joint and bolt. The corresponding legs on each side of the barrow are further united by a cross piece, and are bolted to the handles and body.

An improved smoking cartridge has been patented by Mr. Edward A. Smith, of St. Albans, Vt. The shell of the cartridge is made of asbestus paper, and is not consumed in smoking and may be refilled. The cartridge filler is provided with wires that pass down into the shell, and after the shell is packed with tobacco are drawn out with the filler, leaving draught passages for air. A split metal collar fits over the end of the cartridge and into the end of the smoking tube, making a tight joint at the end of the tube.

A fire escape, that occupies but little space when not in use and can be quickly made ready for use, has been patented by Mr. Andrew Swanson. of New York city. The escape consists of ladders made of semicircular side bars, connected by rounds that are pivoted at their ends to the side bars, so that the side bars may be closed together. The end of the rounds are formed square at one angle to press against the side bars, and prevent the rounds from passing below a horizontal position.

An apparatus for separating the flat coffee berries from the round has been patented by Mr. Elam Rakestraw, of Cambridgeport, Mass. A reciprocating shoe is provided with two series of screens, one series having round apertures, through which the round berries pass, and the other having slots through which the flat beans pass, the flat and round beans passing into separate chutes. Sieves for separating the different sizes are also provided.

An improved button fastener, consisting of an open hook formed on or secured to a suitable base and a spring tongue also secured to the base. The hook is passed through the cloth or leather, and the eye of the button hooked on the fastener, the spring tongue retaining the button to the fastener. The fastener has been patented by Mr. William S. Spencer, of Sturgis, Mich.

An improved gate latch has been patented by Mr. William H. Marshall, of Oxford, Miss. A latch provided with oppositely projecting side arms slides vertically in a recess in the end post of the gate. The lower face of the latch is recessed to adapt it to engage with a catch secured to the post. Two lugs that project toward each other are formed at the lower edge of the recess, and prevent the gate from being lifted from its hinges by animals.

Therese R. Fischer, of Baltimore, Md., has patented an improved dress form, to be used for fitting and exhibiting dresses. The form is preferably made of willow rings arranged in a horizontal position one above another, and connected by withes to which they are suitably attached. The rings are made of such relative sizes that the figure will have the general shape of a woman's dress. A frame having the form of one end of an ellipse is attached to a lower ring to support the train of the dress.

An improvement in windmills, by which the wind wheel is automatically adjusted according to the force of the wind, has been patented by Mr. Christian B. Harman, of Lanark, Ill. The vane of the wheel is pivoted to the stock to which the wind wheel is attached, and around which it rotates, and is so attached to the wheel by levers and connecting rods that by the force of the wind it is swung around to carry the wind wheel out of the wind, reducing its speed.

Mr. Hermann Hahn, of Sönberg, Germany, has patented an improved chimney ventilator. An angular cowl is mounted to turn freely on the top of a chimney. Two concentric funnels are attached to the open end of the cowl, in such a manner that the larger ends of the funnels are toward the open end of the cowl. The wind passes in the funnels and produces a suction, causing a strong draught in the chimney. A deflector keeps the open end of the funnels always toward the wind.

Improvements in steam feather renovators have been patented by Mr. Samuel Tate, of Sandusky, O. A steam cylinder adapted to be opened for the admission of feathers, has in its lower part a semi-cylindrical metal partition. The usual steaming and stirring apparatus is in the cylinder, and when the feathers are sufficiently cleaned steam is admitted below the metal partition, heating it and drying the feathers.

Mr. Jonas Hinckley, of Norwalk, O., has patented an improved carpet sweeper. The shaft of the rotary brush is adapted to be raised and lowered in recesses in the side pieces, and is made with pulleys on each end driven by a cross belt from driving pulleys that rest on the carpet. The plane of the driving pulleys is inclined so that the cross belt does not strike in the center to rub or chafe.

An improved method of making flexible bracelets has been patented by Mr. Shubael Cottle, of New York city. A circular spring is made of size sufficient to inclose the wrist. On the outside of this spring is placed a flexible casing, composed of spiral strips of sheet metal which are of a hollow, half-round cross section, wound in spiral convolutions about the spring with their convex sides out. The spiral strips are made ornamental, and the bracelet thus formed is easily expanded to pass over the hand to the wrist.

Mr. Robert M. Skiles, of Davenport, Ia., has patented improvements in evaporators and heaters. The air to be used for evaporating and heating is heated by pipes placed over a furnace, and connected to a pipe extending to the evaporating chamber through which it is drawn by an exhaust fan, and again thrown into the heating chamber to be heated, thus using the same air over and over and saving all the heat and also saving fuel.

A combined chair and child's crib has been patented by Messrs. Joseph B. Welsh and Harry Trudell, of Richmond, Va. The chair has a slat bottom, and upper and lower rails at the sides, and at the forward edge of the bottom is hinged an extension bottom, that folds into the chair and forms the bottom proper. A frame is made similar to the chair frame, only a little smaller, so that it will fold inside the chair frame. This frame is provided with legs, and when folded the legs and chair back together to form one finish. Messrs. Welsh and Trudell have also patented certain novel features of construction, by which reclining chairs are adapted to be converted into couches.

Mr. Moses Cohen, of Hallettsville, Texas, has patented a mechanical fan, adapted to be attached to the ceiling and used in connection with a barber's chair. A swinging bar of metal or wood is secured to the ceiling at some distance forward of the chair; to its lower end are attached fans, and to its upper end a weight to retard the backward motion of the bar. By pulling a cord attached to the bar and passing over pulleys to the chair, the fans are operated.

An improvement in sealing devices for fruit jars has been patented by Mr. Johnston Irvin, of Elk City, Pa. The upper edge of the fruit jar is made wedge shape. The cover of the jar is provided with a wedge shaped annular recess, corresponding with the rim of the fruit jar, and in this recess is placed a rubber packing ring having inclined edges to fit the recess of the cover, and a wedge shaped circular groove to receive the edge of the jar. The cover is held to its place by a screw cap.

A novel spelling toy and puzzle has been patented by Mr. William H. Reiff, of Philadelphia, Pa. Circular disks of different sizes made of cardboard are laid one upon the other, the top disk being the smallest, and the lower one and largest is made square. Upon the faces of the disks next their outer edges are printed the letters of the alphabet. With this device any word containing as many or less letters than the number of disks can be spelled by turning the disks to bring the letters of the words in radial lines.

An improved stump puller has been patented by Mr. Toliver Rice, of Enfield, Ill. Upon a suitable frame is pivoted a lever having a cam head and lifting chain. At the rear end of the frame is a shaft, provided with ratchets and pawls for winding, and holding chains that attach to the end of the cam lever. By this device great leverage is obtained for pulling stumps or for raising any heavy weight

An improved method of making latch needles for knitting machines has been patented by Mr. Frank B. Woodward, of Hill, N. H., and consists in upsetting the wire from which the needle is made a short distance from the end, to form a lug in which a recess is made to hinge the latch of the needle. Much labor and expense are saved over the old method of reducing the wire to form the lug for the latch.

Messrs. George E. and Charles C. Bauder, of Bonaparte, Ia., have patented improvements in saddles for harness. The improvement consists in hinging the base plate of the water hook to the upper ends of the side pieces of the saddle-tree, so that the side pieces adjust themselves to the back of any sized horse. The housings and pads are secured to the side pieces in the usual manner.

A toy merry-go-round has been patented by Mr. Charles F. Cornelius, of New York city The toy consists of one or more platforms bearing images of men and beasts, or fantastic figures placed on a box, and adapted to revolve in different directions by mechanism placed in the box, that is operated by a crank secured to a shaft projecting through the side of the box.

Notes & Queries

HINTS TO CORRESPONDENTS.

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.

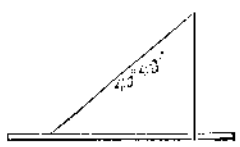
Any numbers of the SCIENTIFIC AMERICAN SUPPLEMENT referred to in these columns may be had at this office. Price 10 cents each.

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) E. R. asks for the simplest way of melting brass for soldering leaks in copper kettles. A. The brazing of anything articles made of copper requires much experience. If the copper kettles are such as confectioners use, they are too valuable to be experimented with by new hands. We recommend you to send such to a good coppersmith. If you wish to try it, you may clean the copper around the leaky place by scraping, apply a little pulverized borax to the part, cut some sheet brass in very small pieces or threads, and lay enough upon the spot required to be soldered to close the part; place the part over a small charcoal fire in a forge and blow very gently; look upon the inside where you have placed the solder and see that the borax, in puffing up, does not displace the solder; if it does, put it back with a small stick. Do not be in a hurry, and do not heat any part too hot, or you may burn a hole in the kettle instead of soldering it. Better try on a piece of thin copper first and get a little experience.

(2) D. F. H. writes: A friend says that the fall and head of water are the same. I say that the head is the depth of water in the pond, and the fall is the number of feet from the bottom of pond to the bottom of wheel. Who is right? A. The terms "head and fall" have come to be somewhat mixed. When old millwrights spoke of "head and fall" they meant the whole fall from surface of water in penstock to the surface in wheel pit, the head being from the surface in penstock to the center of gate opening, and the fall from the center of gate opening to surface of water in wheel pit. Now the "head" is defined as the "difference in height from the surface of the water in the wheel pit to the surface in the penstock," and the term "fall" is given the same definition.

(3) N. G. V. asks (1) how to construct a sun dial. I have an iron stand with a solid foot and a fluted column, on top of which is an iron plate about 30 inches in diameter. I bought it from an old iron heap. A. Set the plate of your pedestal perfectly level; make a triangular plate or style with one angle equal to the latitude of your place; say for Passaic, 40° 43′, and of this shape; set it upon the plate parallel with the meridian. The edge of the style should then correspond with and be parallel with the axis of the earth. Then lay off with a protractor lines radiating from the foot of the style as a center, and from the meridian line the hours as shown in the table. Take your departure from the side of the style if it has any thickness upon the edge.



For	XI.	and	I. hour	9° 55′
"	X.	and	II. hour	20° 36′ 30″
"	IX.	and	III. hour	33° 7′
"	VIII.	and	IV. hour	48° 29′ 30″
"	VII.	and	V. hour	67° 40′
"	VI.	and	VI. hour	90°
"	V.	and	VII. hour	112° 20′
	A.M.		P.M.	

The formula is: h=hour from noon.
l=latitude of the place.
x=angle required for the hour.
Tan. x=tan. h sine× l.—So that if you wish to work out the half and quarter hours trigonometrically you may exercise the opportunity. The dial will indicate true time only on four days of the year, viz., on the 15th of April and June, the 1st of September, and 25th December. Its greatest variation from the sun's unequal motion will take place in October and November, amounting to 16 minutes too fast. The other extreme occurs in January and February, amounting to 15 minutes too slow. 2. Will you inform me which works on phonography are generally used by newspaper men and law courts? A. Pitman's and Graham's are generally used, we believe.

(4) W. C. R. asks: 1. What kind of glass will be best suited for an object glass of a telescope six inches diameter about, and where can I get it? A. A glass formed of a disk of flint and one of crown cemented together. You can procure it from Feil of Paris, or a reliable local optician. 2. What will they cost in their rough state? A. About $75. 3. How can I detect impurities in laurel oil, such as is used in the east as a hair dressing? A. Add a small quantity of alcohol to the oil, mix this with a solution of caustic potash in alcohol and a few drops of chloride of iron, after the mixture has cooled pour in a few drops of a solution of chloride of lime, when, if the laurel oil is adulterated with the artificial preparation, a violet color will be developed, otherwise it will not be changed.

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