

RECENTLY PATENTED INVENTIONS.
Pertaining to Apparel.

WRISTLET.—R. N. THOMAS, Shenandoah, Iowa. The body of the wristlet is composed of an approximately rectangular sheet of flexible material such as leather, and the two straps are connected with the sheet by means of slits. The rivets are prevented from contact with the skin by the straps passing thereunder. Only one rivet is needed for each of the portions, and no additional material is required for attaching the buckles.

SKIRT.—W. EPSTEIN and S. EPSTEIN, New York, N. Y. The aim in this instance is to provide a skirt or petticoat provided with an expansible and contractible waistband for use in fitting different sized waists, and arranged to form the desirable dip at the front and to dispense with the undesirable slit or placket at the back.

Electrical Devices.

CONTROLLER FOR ELECTRIC MOTORS.—R. L. MUNSON, Seattle, Wash. The invention is in the nature especially of that form of controller of compact limits and portable character known as starting-boxes, the same being also capable of use as "phase splitters." An object is to provide a starting box which can be either dust proof or of ventilated pattern in which easy access may be had to the resistance coils for conveniently inspecting, repairing or replacing the same.

CIRCUIT-CLOSER.—W. E. HUBBARD, Den- nis, Texas. The special object of the invention is to provide a timer or circuit closer for the ignition system, in which both of the terminals are not only insulated from each other, but are also insulated from the engine frame. In this patent stray currents cannot deplete the battery and the minimum amount of electricity may be employed.

DISK-INSULATOR.—L. STEINBERGER, New York, N. Y. This invention enables several disks of insulating material to be locked together upon a pin independently of the support for the pin; enables the disks to fit together watertight without undue strain upon their material; provides the disks with corrugations of various kinds for providing increased surface for surface leakage; facilitates drainage of moisture to render it harmless; enables certain disks to be screwed directly together independently of the support; enables the disks to be readily removed; and provides an insulator disk as an improved article of manufacture.

CIRCUIT-CONTROLLER.—S. HOLLAND, Park River, N. D. In the present patent the invention relates to ignition devices for multiple cylinder explosion engines, and its object is the provision of a new and improved circuit controller, arranged to permit of varying the time of the contact, to take up wear to a minimum, and to prevent oxidation of the contracting parts, thus insuring at all times perfect ignition of the explosive charge.

ELECTRIC-CORD RETRIEVER.—W. O. REW, Eureka, Cal. The construction comprises a reel or spool upon which the cord is wound, and the invention resides especially in the construction of the reel, which facilitates the attachment of the electric wires and the arrangement for conducting the current to them through the device. It also resides in the mechanism for controlling the rotation of the reel and locking it so as to adjust the length of the pendent cord.

Of Interest to Farmers.

CULTIVATOR.—J. T. MILLER, West, Texas. The object of this invention is to provide improvements in cultivators, whereby the plows can be quickly and conveniently set to any desired pitch for use in deep or shallow plowing, and without requiring the loosening of bolts or like cumbersome manipulations.

COTTON-CHOPPING MACHINE.—E. A. McREYNOLDS, Stanford, Ill. This invention has reference to a class of implements employed for use in removing alternate equal portions of growing rows of cotton plants, to permit access to the blocks of plants left remaining, and promote their growth by subsequent cultivation around the plants.

TAPPING DEVICE FOR COTTON-PRESS-ES.—S. S. RAY, Maysville, Ga. The device is preferably used in those balers having rotary bale chambers which can be swung under the tamping device and the cotton packed down into one chamber, while the cotton in the other chamber is being compressed by a hydraulic plunger or other suitable means.

CHECK-ROW PLANTER.—O. BROWN, Morrison, Iowa. The more particular purpose here is to provide a type of planter, in which the spacing apart of the hills in the general direction of travel of the planter is done, without the necessity of a stationary actuating wire. Means are provided which are controllable by the automatic action of the machine for varying the spaces between the hills so as to render the same suitable for land surfaces of varying conformity as the machine passes over such surfaces.

HARVESTER.—C. M. McCORMICK, La Junta, Colo. The invention relates more particularly to machines for harvesting crops such as sugar beets, and the like. Specifically, it relates to one having a topper for removing the tops or leaves of the beets, and including means for severing the leaves which lie upon the ground as well as the standing beet tops from

the roots. Mr. McCormick has invented another harvester and the object of the improvement is to provide an apparatus for use for sugar beets and the like in which the plow can be operatively and inoperatively arranged in a plurality of positions in which a feeder is provided for laterally displacing severed beet tops or other foreign bodies from in front of the plow, as the latter travels along.

SEED-PLANTER.—W. A. ROCKWELL, Har- riman, Tenn. In the present patent the improvement pertains to the plunger attachment of the rotatable seed wheel, also to means for use in governing the discharge of seed from the hopper and the wheel. The invention is not limited to corn or peas, but is available for planting oats in drills, also for planting sorghum, cane-seed, beans, etc.

SEED-BOX.—A. G. YATES, Friend, Neb. The box is such as is used in connection with seed depositing implements. The object of the invention is to produce a box having means for dropping different numbers of seed or seeds of different sizes. The seed-box is particularly applicable to corn-planters.

GATE.—P. H. WILSON, Talent, Ore. This swinging gate is of a type usually termed a farm gate and employed for guarding openings into fields from a roadway. The object of the invention is to provide novel details of construction for a gate, and afford means for manually opening the gate in opposite di- rections.

SHOCK-LOADER.—E. PITCHER, Verona, N. D. The loader is designed to continuously pick up grain shocks and discharge them on a de- livery mechanism while still in an upright position, and by the mechanism convey them to a wagon. In this manner of gathering up the shocks they are not roughly shaken, and much grain is thereby saved from waste.

COTTON-CHOPPER.—S. T. HOGAN and F. KNETSCH, JR., Creedmoore, Texas. When the machine is drawn through a field gearing means rotate the shaft, thus swinging the blade of a hoe into and out of contact with the ground. A lever raises or lowers the front end of the frame to cause the hoe to cut more or less deep in the ground and another lever moves the frame longitudinally to keep the frame aligned with respect to the cotton row regardless of the position of the tongue. The frame is tilted both vertically and longitudinally with respect to the tongue for the purpose of adjusting the depth of the stroke of the hoe and to adjust the trans- verse position of the impact.

Of General Interest.

MULTIPLE COLOR AIR BRUSH.—E. J. FRAZIER, Buffalo, N. Y. The invention relates to certain improvements in sprayers or atom- izers in which a plurality of containers are employed, whereby any one of a plurality of different fluids may be sprayed from a single device and under the influence of a single air jet. It is primarily designed for spraying paints and colors, where it is desired to fre- quently change the color employed.

APPARATUS FOR APPLYING INTERNAL MASSAGE.—F. L. TALCOTT, New York, N. Y. The invention is designed for the cure of in- flammation of the prostate gland, whether of an acute, sub-acute, or chronic nature, and relieving all symptoms arising therefrom. The result is accomplished through the agency of water, or other fluid, at the proper tempera- ture, which by a succession of intermittent hydraulic pulsations is made to impart a mas- sage effect, without the water actually coming in contact with the walls of the passage into which the instrument is inserted.

FIRE-ESCAPE.—P. NIGRO, Clarksville, Tenn. The frame is placed on the wearer's shoulders with the opening engaging the neck, and the crossing of the straps on the back. The free ends of the strap are then brought upwardly under the arms and to the opposite shoulder and into engagement with the buckles, the belt being buckled around the waist. The wearer now engages the loops with the hands and is prepared to leap, the air imprisoned beneath the fabric material serving to uphold the wearer and break the force of the fall.

POTTERY ORNAMENTATION.—A. L. ROCK, Yokohama, Japan. The ornamentation is arranged to produce a permanent glass bead effect on porcelain vases and other pottery articles, in such a manner that the colorless transparent glass beads are fused in position on the body of the pottery article by a fusing pigment which produces color effect in any predetermined design.

SHOW-CASE.—A. C. UCKER, Everton, Mo. The inventor's object is to provide a show- case which is open at the bottom and in which is disposed a frame with shelves, the frame being readily removable through the opening in the bottom of the case and being held yieldingly within the case by means of a spring catch.

MOLD.—L. DIAZ, Habana, Cuba. The in- vention relates to the manufacture of tiles, flags and like articles, and its object is to provide a new and improved mold, arranged to permit of quick opening of the mold frame, for removal of the pressed article, and to allow convenient handling of the mold plate or die.

DETACHABLE HOOK FOR SHAFT-WORK.—C. O. VOWELL, Red Lodge, Mont. The ob- ject of the invention is to provide a hook which may be used as a safety device for the

protection of the lives of miners who are carried up and down a shaft. It is equally applicable to certain types of elevators which are drawn up and down a shaft by means of cables attached to the upper part of a cage and which pass over pulleys at the top of a gallow's frame.

PROJECTING APPARATUS.—V. E. MELLRE, New York, N. Y. The invention involves a box or cabinet, having a plurality of mirrors arranged upon the inner surface of the walls of the box, so that the light rays from the bodies will be reflected and converged through a lens carried in one wall of the box so as to project the image upon the screen.

Hardware.

HOSE-CLAMP.—P. E. ERICKSON, Port Ches- ter, N. Y. In this patent the object is to strengthen hose clamps at points subjected to the greatest strain, i. e., points where the nut for the screw is applied, and the bearing for the inner end of the screw; and further aug- ment this strengthening by locating the screw as close to the perimeter of the clamp as prac- ticable.

BRIDLE AND THROAT-LATCH SNAP.—B. L. MILLER, Yazoo City, Miss. The more particular object of this inventor is to provide a device which may be applied to throat- latch straps, to slide thereon and snap into engagement with the straps, to more quickly and conveniently secure the latter in the ad- justed position on the horse's head, without the use of the ordinary buckle.

TOOL-HOLDER.—G. F. KRIEGER, Grand Rapids, Wis. This holder has an adjustable member which will enable a tool to be clamped adjustably upon the tool holder in any desired position, the construction being such that the tightening of the clamping means for holding the tool upon the adjustable member also op- erates to secure the adjustable member upon the body of the tool holder.

AUTOMATIC WINDOW-LOCK.—A. N. DAVIS, New York, N. Y. In the present in- vention the improvement has reference to locks that are used upon windows, sliding doors and analogous closure members, the special purpose of the inventor being to increase the adaptability and uses of a lock of this kind by changes in its structure.

PAPER-CLIP.—C. W. SANDERS, Chicago, Ill. The clip is made of suitable spring wire and can, if desired, be made in various sizes, the usual size being about one inch square, and it may be plated or otherwise finished. The bar is so arranged that papers can fold over the same readily, whichever side of the clip is upward, the arrangement of the bar being the same.

SECTIONAL STAND.—F. G. GRIMLER, Buf- falo, N. Y. The invention resides in an im- proved means by which the several movable members or units of the stand are held in assembled relation; also in improvements in certain species of units themselves, together with means for detachably holding the lamp socket at the upper end of the stand. It is an improvement in stands disclosed in Letters Patent formerly granted to Mr. Grimler.

LOAD LIFTING AND RELEASING DE- VICE.—M. C. MYERS, Oroville, Cal. In this instance the invention is an improvement in devices in the nature of tongs adapted for lifting a load such as bales, packages, logs, weights, and various other articles. The im- provement relates chiefly to means attached to the tongs proper for gripping and releasing a load.

NUT-LOCK.—C. H. FERGUSON, Jersey City, N. J. This invention relates to certain im- provements in nut locks, and more particularly to a special construction whereby an ordinary nut may be locked to an ordinary bolt or to a second nut, without necessitating any changes whatsoever in the construction of either the nut or the bolt.

PACKAGE-FASTENER.—W. M. CLEAVE- LAND, Highlands, N. C. The purpose here is to provide a device, for convenient and re- liable service, as a means for releasably secur- ing a cord or band in wrapped condition upon a package of mail matter or other material it is desirable to temporarily secure, in a manner which will permit the package to be quickly opened and re-fastened.

BELT-FASTENER.—P. A. HUDSON, New York, N. Y. The object of this inventor is to provide an improved belt fastener, more espe- cially designed for fastening the ends of laminated leather belts, fabric belts and other belts securely together and without danger of unduly weakening the laminations of the weave. The prongs are preferably of a length corresponding to the thickness of the belt.

LOCK.—V. BILY, New York, N. Y. The in- vention pertains to locks such as used on doors. It relates especially to that type of lock in which the lock may be unlocked from the outer side of the door by means of a key, which may be opened by means of a sliding knob or similar means on the inner side of the door.

SAW-HANDLE.—F. L. BLOMQUIST, La Honda, Cal. The handle is of the detachable class. The aim is to provide a construction which affords a light handle that may be readily mounted upon the heel of a saw blade, and be quickly secured thereon in a reliable manner, and be readily released and removed from the blade.

Heating and Lighting.

GAS-BURNER.—G. S. ANDREWS, Butler, Pa. The main objects here are to facilitate the movement of the gas-delivery nipple in a lateral direction and about a turning plug having horizontal axis; to provide closer connections between mixing tube and nipple; to utilize the tube for normally preventing the lateral move- ment of the nipple; to provide for regulating inflow of air to tube; to provide an improved form of tube; to provide for lateral adjust- ment of chimney and mantle-carrying part, and to provide a regulating plate at which the burning takes place.

PERFECT RADIATOR.—O. T. BROWN, New Vienna, Ohio. By changing the position of slides, the fluid circulates through greater or lesser travel. By arranging the slides, a por- tion of the tubes might be cut out from the direct travel of the fluid. Tubes are spaced apart a sufficient distance, so that air can circulate freely, and every part of the radiator is accessible without dismantling or disas- sembling. In damage to one or more tubes, such tubes can be closed without interfering with the fluid flow through the remaining tubes, thus permitting a closure of a leaking tube without loss of time in repairing.

HEATING-STOVE.—E. B. COLBY, Mont- clair, N. J. The invention relates to stoves and furnaces, and the object is to provide a stove which is simple and durable in con- struction, cheap to manufacture, very eco- nomical in the consumption of coal and other fuel, and arranged to provide an exceedingly large amount of heating surface.

Household Utensils.

BEDSTEAD.—H. A. SEARS, Portland, Ore. The object here is to provide a device which is constructed in sections, the foot section being adapted to be lowered so as to constitute the foot rest of a chair, and a head portion being adapted to be raised so as to form a back rest, manually operable means being provided for moving these sections into the de- sired positions.

MOP-WRINGER.—J. SANTIN, El Reno, Okla. One object of this improvement is to provide a wringer which is adapted to carry a pall or other receptacle for water or the like, by means of which a mop or similar device can be thoroughly wrung out and freed from ad- hering water, and which is operable by the pressure of the foot upon a suitable foot-board.

FLOAT-VALVE FOR FLUSHING-TANKS.—W. N. LONG, Eugene, Ore. It is the purpose in this case to provide a very quick acting valve, and one that when opened will divert the water to the bottom of the tank, and which when closed will be perfectly concealed, the operation of opening and closing the valve being automatic.

TABLE ATTACHMENT FOR BEDSTEADS.—MARY E. COWDREY, Arlington, Ga. The in- vention is an improved attachment for bed- steads and cribs for use in supporting a table over the bed. The attachment may be readily applied to, or removed from bedsteads, cots, and cribs and may be easily adjusted higher or lower as required by conditions.

REFRIGERATOR.—G. MEY, Prinzenhal, Near Bromberg, Germany. In this apparatus the water drawn off say for cooking, washing, drinking, etc., in passing through the main pipe cools the refrigerator, and arrives through an extension pipe into the ejector, where it sucks in the air through another pipe and drives the air toward the refrig- erator through an air pipe. Both cooling and ventilation are thus carried out without cost.

FRYING DEVICE.—J. RENNER, Rockwell City, Iowa. The invention has reference to cooking utensils and it has for its object the provision of a frying device which will pre- vent the grease from becoming scattered over the kitchen floor; one which can be construct- ed at little expense and one which is econom- ical in use.

Machines and Mechanical Devices.

ICE-MACHINE.—J. B. MCCALL, Colorado, Texas. The invention is an improved appa- ratus for use in the manufacture of ice in small quantities, more especially designed for those living in sparsely settled sections and isolated places, where they are unable to, or cannot reasonably, obtain a supply of ice from regular manufacturers.

MIXING AND KNEADING MACHINE.—R. T. GRIFFITHS, Pittsburg, Pa. In view in this invention is a construction embodying a pall provided with handles, a cross-bar on which the mixing and kneading are journaled, engaging with the handles and held against lateral movement thereby when seated on top of the pall, and means for binding the bar to the top edge of the pall, holding it from dis- placement in a vertical direction. A crank is provided for the device, and a cover for the pall to engage over the handles and a U-shape clamp to hold the pall in fixed position.

VARIABLE-SPEED DRIVING MECHANISM.—R. M. RUCK, 44 Thurloe Square, South Ken- sington, London, England. One object of the invention is to render a mechanism of this kind available for use on motor vehicles and in connection with other machinery driven with high-speed engines, in such manner that the velocity of the transmitted motion may be varied (say) from a maximum to nil and beyond the latter so as to obtain reversal, yet without the necessity of interrupting the run-

ning of the engine or altering its speed or direction of rotation.

PUMP.—L. K. PULLIAM, Pensacola, Fla. The invention relates more particularly to that type of combined engine and pump in which there is employed a single cylinder having a piston therein, the space at one side of the piston serving as a power chamber and the space at the opposite side of the piston serving as a compression chamber.

WATER-POWER BLOWER.—J. L. WARE, Terry, Miss. The invention relates to a blower for use in connection with the forges of machine shops and other metal working plants of a similar nature. The object is to provide a combined blower and water motor having comparatively connecting parts. It may be readily taken apart and reassembled.

SAND-FEED FOR STONE-SAWING MACHINES.—J. M. OWENS, Oolitic, and J. A. ROWE and E. E. MITCHELL, Bedford, Ind. The invention provides a feed in which there is a tank at higher elevation than the sand box parallel therewith, there being a plurality of outlets for the tank and box, those for the box having openings therein, above which are disposed the lower terminals of the tank outlets respectively, the tank having an overflow which leads into the box, and the box also being provided with an overflow, the outlets from the tank and from the box being commanded by valves.

ATTACHMENT FOR SEWING-MACHINES.—E. J. MILLER, Shamokin, Pa. More particularly the invention relates to attachments such as are adapted to be removably secured to the balance wheels of the machines, and each of which consists of a frame having a grinding rim formed of emery, carborundum, or the like, arranged thereon, and adjustable means for removably securing the frame to any ordinary balance wheel.

ATTACHMENT FOR TYPE-SETTING MACHINES.—H. A. ARMSTRONG, New York, N. Y. The attachment is particularly useful in connection with linotype machines having movable metal pots. One object of the inventor is to provide an attachment which comprises a signal bell, a float arranged within the metal pot of the machine and controlled by the metal level therein, and mechanism operable by the member, and serving to sound the bells when the member is in a certain position owing to the falling of the metal to a predetermined level.

AUTOMATIC LOCKING-RECEPTACLE.—J. W. CARTER, Turnersville, N. Y. The receptacle is especially useful as a holder for milk bottles and the like, where there is a constant danger of unauthorized removal of the bottles after they have been delivered. An object of the invention is to provide a receptacle having means for automatically locking the same when an object has been placed therein, and which necessitates the opening of the door or the like, to permit the release of a trigger to unlock the device.

MOUNTING FOR BOTTLE-WASHER BRUSHES.—A. N. DAVIS, New York, N. Y. The invention relates to bottle washer brushes, the more particular object being to improve the mountings of such brushes. The brushes are actuated in the usual manner, the water being caused to flow through a spindle, the interior of the bottle being effectively washed. The operation completed, the withdrawal of the cleaning device from the bottle causes the brushes to be forced toward each other for an instant, and they spring backward into normal position immediately afterward.

UNIVERSAL JOINT.—J. ELKAN, New York, N. Y. The improvement pertains to the transmission of power, and its object is to provide a joint, which is simple and durable in construction and arranged to permit of running shafts at any desired angle one to the other, and of changing the angle to suit existing conditions.

MECHANICAL MOVEMENT.—W. H. GASKILL, Wilson, N. Y. The invention refers to mechanical movements, and more particularly to an automaton mechanical movement suitable for simulating the motions displayed by an animal or a man in walking. It is of peculiar value in relation to propelling vehicles, for steering the same, and for use in sporting devices and in toys.

REVERSING-GEAR.—A. N. WOODS, Corvallis, Ore. The object of the invention is to provide a new and improved reversing gear for traction engines and other power vehicles, and arranged to permit convenient and quick reversing for driving the vehicle in the desired direction.

CASH REGISTER AND INDICATOR.—J. F. PARKER, Kansas City, Mo. A distinctive feature in this case is a bank of keys provided for registering and indicating the nine different amounts, in cents, ending with the numeral "5" such as 15, 25, 35, etc. Machines of other classes operate two keys in order to register any of the above amounts, while in the present, the same results are accomplished by one. Another, is the means for indicating amounts so that they are exhibited from the four sides of the register making them visible from any part of the room.

Prime Movers and Their Accessories.

VALVE.—N. B. CRIGHTON, New York, N. Y. The aim in this case is to provide a valve, simple and durable in construction, and ar-

anged to reduce the friction of the moving parts to a minimum, to allow convenient opening and closing of the valve and to permit of interchanging the actuating parts for use on either side of the valve.

ROTARY ENGINE.—C. FORD and D. F. HELMER, Grand Rapids, Mich. While the invention relates more particularly to internal combustion engines, it relates also to improvements to steam engines, and its object is to provide a thoroughly efficient rotary engine with which the full force of the explosive or expansive effort of the explosive or expansive element that is used for driving the engine may be utilized.

ROTARY ENGINE.—G. L. WEBSTER, Midlothian, Texas. When the parts in this engine are arranged and adjusted they engage each other at the proper time. Consequently high or low speed makes no difference in operation, the degree of speed being a question of pressure and strength of material. Any form of governor may be used. Cams for opening and closing the abutment are independently adjustable on the shaft so they may be set with great accuracy to operate.

MEANS FOR INJECTING WATER INTO THE CYLINDERS OF COMPRESSORS.—A. E. JONES, Via Volosca, Fiume, Hungary. The object of this invention is improvements in compressors for air or other gases and relates more particularly to means for automatically supplying the cylinders with injection water. It comprises more particularly a coil supplied with live steam, arranged in the water circulation jacket of the engine and opening into the cylinder.

Railways and Their Accessories.

WASTE-SUPPORTING ATTACHMENT FOR JOURNAL-BOXES.—R. A. BILLINGHAM, St. Marys, Pa. The boxes have lateral grooves in which members of the attachment may be slid, there being grooved lugs disposed at forward ends of the side members to permit of a front waste retaining member being slid into position. The latter has its upper terminal curved outwardly and is adapted to engage the lid of the box, by which it may be pressed inwardly, the upper terminals of the side waste retaining members being disposed in close proximity with the journal to prevent waste from passing around the journal under the brass. The attachment also prevents the waste from working forward and hanging out of the box.

Pertaining to Recreation.

BASE-BALL CURVER.—W. W. WINQUEST, Brady, Neb. The purpose of this invention is to provide a simple, serviceable and inexpensive ball curver adapted to be arranged on the fingers, and having means for engaging the cover of the ball so that a decided curve may be imparted to the latter in pitching.

GANG FISHING-HOOK.—S. R. SUTTON, Naples, N. Y. The hooks are arranged in groups known as gangs. The object is to provide reliable means for loosely coupling together groups of fishing hooks in sequence, so that they will be free to turn or spin at their coupled connections. An improved swivel link forms a portion of the coupling device.

Pertaining to Vehicles.

WIND-SHIELD.—J. H. SPRAGUE, Norwalk, Ohio. More particularly the invention relates to the construction of the frame of the shield and the method of holding the glass in place. It involves a construction of frame in which the glass is resiliently held between oppositely-disposed plates spaced apart, so that the glass will not be broken by undue pressure, yet will be securely held against movement in the frame.

WAGON-REACH.—H. BRAUN and G. L. WACKEROW, Mellette, S. D. The invention relates to improvements in reaches for use on wagon trucks, and the object is to provide a simple, cheap and efficient means for applying the reach members to a truck. The improvement can be applied to practically all of the wagon trucks now in common use at a very small cost, and will add materially to the life of such trucks.

FIREMAN'S TRUCK.—C. HOLST, New York, N. Y. In this truck two of the more important features relate to the telescoping mast having improved means for raising and lowering the sections and holding them in adjusted position; and a novel form of bridge that is mounted on a carriage the wheels of which travel vertically on the mast, the apparatus having means whereby the bridge may be raised or lowered to the desired position for the manipulation of a hose carried thereby.

Designs.

DESIGN FOR AN EMBLEM.—B. MARTIN, Degraff, Ohio. The design includes on a foundation or base, a horse-shoe crossed by a pennant with crossed base-ball bats between the lower ends of the bats, the whole forming an attractive design relating especially to base ball matters and including with the good luck shoe the representation of the pennant and bats and ball of the game.

NOTE.—Copies of any of these patents will be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.



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Any books on any scientific or technical subject can be furnished. We solicit requests for quotations. The SCIENTIFIC AMERICAN SUPPLEMENTS referred to are mailed for ten cents each. Book and SUPPLEMENT catalogues will be sent free on request. A careful reading of these "Hints to Correspondents" will prevent any misconception as to the uses and will prevent abuses of this column.

(12014) P. H. W. asks: Kindly state why the months of the year are numbered, some with 31 days and some with 30, February with only 28? A. The arrangement of the days of our months is due to two Roman emperors, Julius and Augustus Cæsar. Julius Cæsar revised the calendar, making the common year to have 365 days, and every fourth year to have 366 days. The days of the year were distributed among the months, so that the odd months, beginning with January, had 31 days, and the even months had thirty days, excepting February, which had 29 days in common years and in leap years had 30 days. He also gave his name to the month of July. The months following were named from numerals. Augustus Cæsar followed Julius, and gave his name to the sixth month, August, and in order to get 31 days for it, so that it should be as long as July, named for Julius, he took a day from February and placed it in August. This brought three months with 31 days together. To remedy this Augustus changed September and November to 30 days and October and December to 31 days. Thus our peculiar arrangement of days in the months is because of the vanity of Augustus Cæsar.

(12015) J. P. B. asks: If a mine is from 600 feet to 800 feet deep, and when it reaches this depth it branches in different directions, say several hundred yards in each direction, and it is necessary to force air down to the workers, no matter in what position they may be, can air be forced through a large tube without any trouble to the above tube, say 3 feet or 4 feet in diameter, and air discharged through same, flowing to the 800 foot depth, and conveyed from there in other tubes to its destination? If this is the case, do they have to pump the foul air away, that is, suck it away, at the same time driving fresh air in regularly? The other point is, is the air sucked from below through a large tunnel, or pipe, instead of being discharged from a pump above to the mine below? In which manner is it done, or can it be done either way, by the drawing of the air from below or discharging it from above? In either case, is it necessary to discharge the foul air from the mine? A. There are a number of different systems of mine ventilation, some automatic and some mechanical, and two more or less opposed "schools," one of which argues, "If you get the bad air and smoke out of the mine, the fresh air can be trusted to find its way in;" and the other, "Get your fresh air to the remote places where it is most needed, and it will force the bad air out." If a mine has two shafts connected underground, one of which opens to the surface higher on a hillside than the other, sufficient natural draft will often be provided to ventilate the connecting workings. This condition is often artificially imitated by raising the "collar" of one or other of the shafts on a level, or even by partitioning a single shaft and carrying a sort of chimney higher on one side, leading wooden or metal air ducts from the workings into the bottom of the "uptake" inside, where the warm air rising creates a current assisted by the heating effect of steam pipes down the shaft, and the fresh air flows in automatically. In large mines, especially collieries, with extensive workings, however, the air is almost entirely blown in by powerful fans, is conducted in large ducts to the bottom of the shaft, and from there directed through the workings by means of a carefully arranged system of double doors wherever "roads" cross underground, so that there may be a continuous current from the blower all through the workings to the foot of the shaft, whence the up draft is natural. In one colliery visited by the writer, where

the shaft is just over half a mile deep and workings extend for two miles from the bottom in a more or less horizontal direction, comprising over 20 miles of "road" in all, 500,000 cubic feet of air per minute is blown into the mine, over 200 horse-power being required to drive the blowers alone. There are systems (for smaller mines) by which using a single blower and pipe the current may be made either suction or inblowing, but none to our knowledge in which both mechanical exhaust of foul air and inblowing of fresh air are simultaneously required.

(12016) G. L. asks: What makes the great heavenly bodies and other matter in the universe move? What is the nature of the power or original cause? A. The absolute origin of motion in the matter of the sidereal universe is not positively known any more than the origin of energy or of life, nor is there any likelihood that it ever will be with regard to any one of them. At the same time there are certain developments in progress in the universe, of each stage of which there are numberless repeated instances visible to astronomers with high-power telescopes, of which developments the results will so obviously be planetary systems with a motion similar to that of ours, that we may fairly assume the developments of our system to have been analogous if not identical. These developments commence with a nebula, an immense body of highly-heated gas, revolving inconceivably slowly but unquestionably. Movement having been originated somehow, by molecular attraction or otherwise as may be imagined, its development is comparatively easy. The heavier molecules would attract to themselves the lighter ones, as they observably do in the chemical laboratory, and these small aggregations or nuclei would continually grow by accretion of smaller masses, continually developing motion in every possible direction and resulting in collisions, which again result in increase of size and decrease of number of the individual nuclei as they join each other. Gradually the number of different motions would become less, the resultant attractions being toward the center of the whole system, and this attraction being at first opposed by gaseous expansion, and eventually tending to revolution of the nuclei around the center of the mass. This is most noticeable in the visible nebulae, the observable form of many and the probable form of most of which is spiral, long streamers of luminous gas containing solidifying parts trailing away from them in all directions. This permits of the more rapid cooling of the gases, their condensation, solidification, all the time with increasing density and decreasing volume, resulting in their increasingly rapid motion as gravitation acts on a mass offering less and less frictional resistance to the gaseous atmosphere in which they move. When the immense eruptive tendency of a highly-heated gaseous body is taken into consideration, the tidal effect produced by the attraction of two such bodies approaching each other without collision is amply sufficient to account for the throwing off of the particles, the spiral form of the nebulae, and, combined with the centripetal attraction, for the eventual circular or elliptical rotation of the planetary bodies. This theory, whether or not demonstrably correct, is generally considered to be at least sufficient to account for planetary and other universal motion.

(12017) W. S. asks: 1. Why is twilight so much longer in England than in Spain or North Africa? Is it true that the period of twilight increases as we approach the poles, and if so, what is the cause of the increase? A. Twilight lasts till the sun is about 18 deg. below the horizon in the evening at any place. The sun in the torrid zone descends vertically in setting, and the duration of twilight is least in this region of the earth. The sun traverses 18 deg. in 1 hour and 12 minutes, which consequently is the shortest duration of twilight in the torrid zone all the year. The path of the sun makes the least angle with the horizon in the northern hemisphere in the summer, and hence a longer time is required to bring the sun 18 deg. below the horizon. Twilight then lasts about 2 hours in latitude 40 deg. north. On the Arctic circle the sun at the summer solstice just touches the northern horizon, and daylight lasts through the 24 hours. There is no night. At the north pole twilight is about 2½ months, or from the middle of January to March 22, when day begins. Duration of twilight can be calculated for any latitude at the sea level by trigonometry. At high altitudes above the sea twilight is said to be of shorter duration than at lower altitudes, due probably to the clearness of the air from dust. We have seen it stated that it is not more than twenty minutes at Quito. 2. Is there any means of determining the voltage and amperage of a current after passing through a Ruhmkorff's coil? Could you give approximately an idea of the voltage and amperage of a current which has passed through a coil that yields a spark of six inches, and that is worked by seven Grove cells (ordinary size)? A. The voltage required to force an electric discharge through air has been determined for various conditions. It is found to be different between needle points from what it is between balls. It varies also with the size of the balls. Between sharp points about 20,000 volts are represented in a spark one inch long, while for six inches about 72,000 volts are required. These voltages have been determined by experiments with alternating currents. With direct currents also many tests