ENGINEERING INVENTIONS.

A car coupling has been patented by Mr. Jacob Rhule, of Pittsburg, Pa. This invention covers an improvement on a former patented invention of the same inventor, to adapt the coupling for use with draw heads of different lengths, and to strengthen and stiffen the draught plate and the angular brace by which it is sustained.

A guide bar for stub switches has been patented by Mr. Frank Nemacheck, of Appleton, Wis. The guide bar has a cylindrical body, with flattened apertured ends, two of them being employed with each switch rail, and so attached that the rails will be positively guided in alignment with the main rails, and the switch be prevented from clogging.

A locomotive boiler has been patented by Mr. Middleton G. Fuller, of Ten Mile Hill, S. C. This invention embraces a live steam pipe for each engine, having a throttle valve, the valves being detachably connected to a single operating lever, so that with one throttle valve the engineer is able to supply steam simultaneously to both engines, or to only one when the other engine is disabled.

AGRICULTURAL INVENTIONS.

A double shovel plow has been patented by Mr. William R. Craig, of Columbia, Tenn. This invention covers a novel construction and combination of parts constituting a double shovel plow not liable to become choked with rubbish, and of which the handles can be readily adjusted at any desired height.

A lever for sulky plows has been patented by Mr. Earl W. Drake, of Poynette, Wis. Combined with a main or lifting lever is a spring-actuated auxiliary lever pivoted to the main lever and adapted to carry the plow, whereby it is designed a sulky plow will do as good or better work in stony ground than can be done with the ordinary walking plow.

MISCELLANEOUS INVENTIONS.

A sash fastener has been patented by Mr. John F. Pool, of Mount Carmel, Ill. The invention provides for the use of catch locks on the sashes and hook catches on the window frame, making a fastening which is automatic, and dispenses with the necessity of sash weights and cords.

A gate hinge has been patented by Mr. James H. Davis, of Danville, Ky. It is a hinge adapted for a gate to be opened by a person approaching it from either side, the invention covering certain novel features of construction, making such hinges capable of more general use.

A flower stand has been patented by M. Herbert L. Starks, of Preston, Conn. This invention covers a novel construction of stand for flowers or house plants, designed to set before a window and made to revolve for more conveniently caring for the plants, the shelves being held to rotate in a free and level manner.

A combination bracket washstand has been patented by Messrs. Gayger D. Tolman and Lorenzo D. Roberts, of Shawano, Wis. It has a folding wash bowl support, consisting of a rod bent to form a circle and secured to a sleeve, with a removable pitcher shelf, and other novel features, making supports for various toilet articles.

A kitchen table and cabinet have been patented by Mary S. Brack, of El Paso, Texas. The cabinet is attached to one end of the table, and forms an integral part thereof, the whole being designed as a piece of furniture with which invalids or weak persons may accomplish considerable work without inconvenience or fatigue.

A window screen has been patented by Mr. George H. Gould, of West Lebanon, Me. This invention covers certain novel features of construction and combinations of parts in a simple and inexpensive screen, which may be quickly applied to or removed from a window frame, and is adapted to fit windows of different widths and heights.

A flash light signal has been patented by Mr. William H. Thompson, of Richmond, Va. This invention is designed to provide a simple and efficient visual signaling apparatus for use for fire alarm or police signals, and consists in a novel construction and arrangement of parts in connection with operative electrical devices.

A vehicle forms the subject of a patent issued to Mr. Wilbur H. Weston, of Newburg, N. Y. The invention consists of a carriage body having the front part of its sides inclined inward, and doors fitted on the inclined parts, making an improved vehicle, permitting easy ingress and egress, without danger of soiling the dress on the carriage wheels.

A mast hoop has been patented by Mr. Thomas Clapham, of Roslyn, N. Y. It is a detachable open mast hoop, consisting of a spring-metal rod bent upon itself to form an approximately open circle or hoop, making a hoop which can be readily attached to or detached from a sail, and the latter be conveniently unbent or bent.

A blanket clasp has been patented by Mr. Donald Walker, of Caledonia, N. Y. It is made of a piece of spring wire bent upon itself in novel form, to be quickly applied to a blanket when in position over the harness, and is designed to effectively retain the blanket in contact with the harness, without piercing or otherwise injuring either.

A mode of securing the fastenings of drilling tools has been patented by Mr. John H. Whaling, of Kingman, Kansas. This invention covers an improved form of coupling designed to prevent the accidental separation or disconnection of the tool or drill from its shaft or rod, the coupling being capable or resisting the great pressure or vibrations to which such tools are subjected.

A balance staff for watches has been patented by Mr. Charles Morlet, of Hoboken, N. J. It consists of a spindle having a shoulder or collar and with a screw thread, a roller screwing on the threaded part of the spindle and against the hub or cross bar of the balance wheel, making a simple and durable spindle for carrying the balance wheel, and facilitating an accurate and quick adjustment or removal thereof.

A combined artificial flower and perfume receptacle has been patented by Mr. Christopher Watson, of New York City. Any suitable form of bottle serves as a support for the flower structure, the petals being suitably arranged and secured by paste or glue to the sides or neck of the bottle, there being also a wrapping around the lower portion of the bottle, with moss-like fiber applied over the wrapping.

A propeller has been patented by Mr. Louis Greget, of New York City. The vessel is constructed with twin hulls, suitably spaced, combined with two series of paddles operated alternately, each series by two crank shafts, the blades of the propellers having a pitch designed to obviate back pressure, and the construction being calculated to give a high rate of speed.

A permutation lock has been patented by Messrs. Conrad A. and Svend E. Johannesen, of Erie, Pa. Combined with two dials and tumblers arranged in connection therewith, a spring plate and ratchet are arranged between the lock case and the outer dial, and an inversely arranged spring pawl plate and ratchet between the dials, with other novel features, the lock being especially applicable for use on post office boxes, as well as safes and doors.

A combined water tower, extension ladder, and fire escape has been patented by Messrs. Achilles Kalinski, Edwin Crippen, and Marcus T. Cashen, of New Orleans, La. It has telescoping pipes which carry ladders, the whole, when at place of operation, to be operated by hydraulic or pneumatic pressure or by chemical gas, the apparatus to be mounted on a truck and adapted to be run quickly to a fire either by horse or steam power.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information, and not for publication.
References to former articles or answers should give date of paper and page or number of question.
Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all, either by letter or in this department, each must take his turn.
Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.
Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(1) Locomotive Mechanic asks: 1. Will you kindly inform me what is an easy and very cheap mode of separating and collecting in quite large quantities, the oxygen from atmospheric air into covered vats or other suitable holders, and so that the remaining nitrogen, etc., may pass off into the circumambient atmosphere, or, if desired, into another holder? A. No such method is known. See Brin's process, described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 623, which we can send you for ten cents. 2. If the covered holder, thus containing the pure oxygen gas only, be sunk or rests in a tank of water, in same manner as illuminating gas in an ordinary holder, which latter rises or falls when the gas fills or empties it through pipes, would the oxygen in question escape through the water in the tank? A. Not to any appreciable extent. 3. What is the specific gravity of oxygen gas, and of atmospheric air, and of common illuminating gas, and of water, fresh and salt, respectively? A. Oxygen gas 1·10563, air the standard for gases 1·000, illuminating gas 0·425 to 0·700. Water is generally taken as a new standard for solids and liquids and is called 1,000. Then salt water of the ocean would be about 1·0274. Water is 816 times heavier than air.

(2) S. H. B. writes: I want to make transparent some thin bond paper to use for tracing drawings; is there any liquid that will do the work and not leave the paper in a greasy state? A. Equal quantities of turpentine and Canada balsam or mastic varnish, or a mixture of spirits of turpentine 6 parts, resin 1 part, boiled nut oil 1 part, by weight, may be used to make tracing paper by application with a brush or sponge.

(3) S. O. N. asks how to make platinum sponge and platinum black, and can they be purchased in market, and where. A. Platinum sponge is made by adding to a solution of platinum chloride some chloride of ammonium and an equal volume of alcohol. The precipitate is filtered out and ignited. Platinum black is made by warming platinum chloride with caustic potash and alcohol, or by dipping the platinum solution into a boiling mixture of three volumes glycerine and two volumes caustic potash solution (sp. gr. 1·08). Dealers in chemicals can supply both forms of platinum.

(4) H. P. B. asks for a formula for silvering the inside of small glass balls. A. Melt together ½ ounce lead and ½ ounce tin, immediately add ½ ounce bismuth, skim off the dross, remove from fire, and before it cools add 5 ounces mercury, and stir well. Keep in a clean glass. To use strain through a linen rag and pour into globe, and move around so as to coat its whole surface. The globe must be perfectly clean. Or, make an alloy of 3 ounces lead, 2 ounces tin, and 5 ounces bismuth. Put into globe and melt over a spirit lamp, moving the globe in all directions so as to coat the entire surface. Finally pour off the excess.

(5) F. C. L. asks: 1. In what portion of the United States are the common dust or heat whirlwinds most numerous? Where do they attain their largest size, and how large? A. In Kansas and Colorado they are most numerous and probably of greatest severity. 2. Do they ever become of dangerous or destructive strength? A. They are very destructive both of life and property. 3. Have any photographs of our tornadoes ever been taken, and if so where can they be obtained? A. For full treatment of the subject and reproductions of instantaneous photographs of tornadoes, we refer you to John P. Finley's most interesting book on "Tornadoes," which we can send you for $1.

(6) W. H.—Beeswax alone may be used for polishing handles, etc., in the lathe. It may be tempered to any degree of softness by heating with turpentine. This must be done with great care to avoid a conflagration.

(7) H. P. R. asks for a recipe for a cement to use in fastening the glass bottom in a photographer's developing dish, one that will withstand the action of chemicals. A. Use sealing wax, melted over the joints with a hot iron, and apply the glass hot.

(8) R. C. says he has negatives which have begun to crystallize. Others have an olive green color in the shadows. The crystallization is due to hyposulphite in the film, which has not been sufficiently washed out. Wash the plates in cool changing water for an hour. The olive green color may arise from the use of an old fixing bath or in not sufficiently washing out the developer. Try soaking the plates in the following:

Alum	2 oz.
Citric acid	1 oz.
Water	10 oz.

for about five or ten minutes. It may clear the shadows.

(9) E. C. R. asks: 1. If the speed of an armature is increased above its critical speed, does the current increase in quantity as well as tension? Which the most? A. The current increases in tension; its increase in quantity follows the same ratio. 2. What is the horse power of the S. E. motor, using 8 cells, plates 5 x 7? A. About one-thirtieth horse power. 3. Can I make the motor do twice as much work by supplying it with twice as many amperes of current? A. Yes, provided you do not overheat the wires. 4. I have an induction coil composed of a bundle core (No. 18 soft iron) 5½ inches long and ½ inch in diameter, which is surrounded by 4 layers of C. C. No. 22. The secondary is of 18 layers, 10 of No. 32 and 8 of No. 38, about 4,000 feet in all. The coil is 1½ inches in diameter. It is wound carefully with layers of shellac between each layer of wire. Would you please inform me from these data what size spark I can get from it? Also whether a condenser increases the size of the spark? A. The condenser increases the size of the sparks. You should get a spark ¼ to ⅓ inch in length. Use about 1 square foot of tin foil in your condenser. It will not be dangerous. 5. If in using the S. E. motor as a dynamo, I should turn the armature at the rate that 16 cells should turn it as a motor, would it give the quantity of current that 8 cells of the same size would give if I should use the same machine for both purposes? A. There is no necessary relation between the speeds when used as a motor and generator.

(10) F. M. D. writes: 1. I have a bicromate battery of six cells, the carbon plates are 2 x 5 in. and zincs are the same size, how large an incandescent lamp ought it to run? A. About 4 candle power. 2. Can I charge a storage battery with this battery? A. Yes. 3. Please describe how to make a