

## ENGINEERING INVENTIONS.

A locomotive engine has been patented by Mr. William J. Tripp, of New York City. It is constructed with large drivers, for high speed, and with the preponderance of weight below the main axle and near the track, in connection with various novel combinations of detail and arrangement of parts.

A railroad crossing gate has been patented by Messrs. Nicholas Thelen, of Schenectady, and Henry Cluever, of Albany, N. Y. This invention provides a novel construction and combination of parts for gates upon each side of a track, which may be readily raised and lowered simultaneously by one person.

A grip for cables has been patented by Mr. Patrick Kelly, of Poughkeepsie, N. Y. It consists of a fixed and a movable jaw, the latter with an eccentric clamping arm, and the latter rigidly connected to a guide arm, with a hook adapted to fit over the cable and hold the jaws in lines parallel with the general line of the cable, the device being especially applicable for tightening derrick cables or guys.

A rotary engine has been patented by Messrs. Louis A. Perrot and Harry W. Warrington, of Richmond, Va. A wheel with buckets and central shaft is fitted in a cylinder, an extension being formed on the cylinder with channels leading in opposite directions to the buckets, while a valve is held in the extension provided with a steam inlet opening and an exhaust opening connecting with the channels.

A car coupling has been patented by Mr. Charles W. Chisholm, of Winnipeg, Manitoba, Canada. It is an automatic coupling of that class wherein a pivoted pin, hook, or dog is employed to engage the coupling link and hold it in position within the drawhead, and it may be set to allow for the uncoupling of the cars, and, when the link is withdrawn from the drawhead, the coupling hook or dog will be returned to a position for automatic coupling.

## AGRICULTURAL INVENTION.

A combined cultivator and pulverizer has been patented by Mr. Joseph Ashenfelter, of Liberty, Neb. It has two connected runners, each carrying an outwardly extending platform crusher, and sets of disks held at an angle to the runners at their rear, adapted for cutting the weeds and hilling rows of listed corn with earth.

## MISCELLANEOUS INVENTIONS.

A band for paper, currency, etc., has been patented by Mr. Oscar S. Matthews, of Dallas, Texas. The band is of paper or like material, with a stiffened back and flexible flaps, on which are secured clips of sheet metal with clamping ends and a tongue, for use in connection with an elastic band.

A book holder has been patented by Mr. William Simmonds, of Yonkers, N. Y. It consists principally of a spring clamp adapted to span the back of the book and grasp the leaves upon either side of the back and hold them firmly upon the covers in convenient position for reading or copying.

A pocket rule has been patented by Mr. Edward R. Billings, of New York City. It is provided with a pivoted plate connecting two sections of the rule, whereby it may be used as a protractor of angles, the invention consisting of the special construction of the rule and the connections of the sliding end of the pivoted plate with the rule.

A rein guide has been patented by Mr. Noah D. Noble, of Carroll, Iowa. It has two arms pivoted to a staple for connecting the rein to the harness, in combination with a roller held at the free ends of the arms, and a fastening device, the object being to reduce the friction of the rein in the guide to the minimum.

A metallic printing block has been patented by Mr. John M. Hawkes, of New York City. It is of novel form and construction, and provided with fixed and movable clamps, whereby electrotype and stereotype plates can be firmly locked in position or released at will, the invention being an improvement on a former patented invention of the same inventor.

A berry box has been patented by Mr. William Henry Moser, of East Portland, Oregon. It is a box made of veneer, made without the use of tacks, having a flap or tongue lock for adjacent ends shaped in a novel form, and in such way that the shaping, cutting, and scoring of the blank may all be done by machine at one operation.

A dry goods exhibitor has been patented by Mr. Andrew J. Nichols, of Ozark, Ark. It consists of a case in which are arranged guide rollers and carrier rollers, so that goods on adjacent rollers will not interfere with each other, and the goods on the several carrier rollers may be fully displayed, and can be readily drawn out for cutting, measuring, etc.

A medicine case or satchel has been patented by Mr. David L. De Myers, of Pierce Station, Tenn. The invention consists principally of a bag or satchel having a central support to which holding devices or clasps are attached for holding bottles, etc., in connection with a special construction of satchel, especially fitted for the use of physicians, surgeons, etc.

A shade exhibitor has been patented by Mr. Robert K. Slaughter, of Brooklyn, N. Y. It is a double-faced revolvable cabinet with swinging frames, either one or both of which may be swung outward, to be placed in a convenient position on the floor of an apartment, and so arranged that either line of shades may be readily exhibited and returned within the case.

A straw rope machine has been patented by Messrs. Cyrus Stephens and Charles A. Carter, of Lewis Creek, Ind. It is for making straw ropes for grain-binding harvesters, the feed being designed so that one or two straws will be fed to the rollers of the machine so as to add them to the rope every two or three inches, to form ropes rapidly of nearly uniform size.

A step ladder has been patented by Mr. William R. Allan, of Pittston, Pa. The supporting legs can be swung toward and from each other, in addition to having a hinged connection with the ladder, thus making a wider support in proportion to the width of the ladder than is possible with rigid supporting legs, and the ladder can be folded to occupy but little space.

A washing machine has been patented by Mr. Henry Bauerfeind, of Shawano, Wis. It has a drum with parallel straight ribs journaled in a tub, vertically grooved plates on opposite sides of the tub, and a rocking frame with parallel rollers journaled in its sides, the washing being done by an alternate backward and forward passing of the clothes between the drum and the rollers by operating a crank.

An apparatus for producing malleable iron or steel direct from the ores has been patented by Mr. Christian Husgafvel, of Pikkasamaki, Finland. The invention covers a novel construction and combination of parts for a system of charging the ore with less coal and reducing the working temperature of the furnace, to thus furnish a completed product without the ordinary intermediate processes.

A method of constructing wagon seats has been patented by Mr. John Q. Flint, of Wilton, N. H. It consists in securing the back piece to a suitable form, bending the parts of the rail over the form and along the edge of the back piece, clamping or otherwise securing the rail to the edge of the back piece, and finally removing the back piece and rail together from the form.

An automatic grain-weighing machine has been patented by Messrs. Valentin Weber and James R. Harrison, of Princeville, Ill. The invention covers a novel construction and arrangement of various parts and details of an improved machine for automatically weighing grain as it is received from the thrashing machine, in connection with a device for registering the quantities weighed.

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## Special.

## OH! THAT HEADACHE.

"How I am tormented with this continual headache! It is ache! ache! morning, noon, and night. It is the last feeling and thought before restless slumber and the first sensation at return of consciousness. It is the terror and torment of my life, and there seems no promise of an end to it while the lamp of life continues to burn. I feel at times as if I must go mad. I move about in my anguish, or must lie prostrate and helpless in my agony, with the sole pity, 'Oh, no! not sick; only has the headache.' But neither insanity nor death comes to my relief. On, on, must I pursue this path of persistent pain. No help, no comfort, no relief. The toothache may be ended by extracting the tooth, but where is the good surgeon that can extract the brain to stop the pain?"

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The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in next issue.

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## Notes &amp; 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) A. S. S. asks what will remove the stain of iodine from the hair of a horse without injury to the horse or hair? A. Try rectified alcohol.

(2) J. A. asks in what manner chemicals are applied to paper, so as to form crystalline coating. A. Mix a very concentrated cold solution of salt with dextrine, and lay the thinnest possible coating of the fluid on the surface to be covered by means of a broad, soft brush. The following salts also produce beautiful crystalline coatings: sulphate of magnesium, acetate of soda, and sulphate of tin. The paper must first be sized, otherwise it will absorb the fluid and prevent the formation of the crystals on its surface.

(3) A. H. wants formula for making line negatives. A. Volkmer's process as detailed in *Photographic Times Almanac* is good, as follows:

Plain Collodion.  
Ether.....500 grammes.  
Alcohol.....400 "  
Pyroxyline.....16 "

Sensitizer.  
Chloride of calcium.....16 grammes.  
Iodide ammonium.....47 grammes.  
Iodide cadmium.....78 grammes.

Dissolve in 100 grains of absolute alcohol and mix with the collodion.

Silver Bath.  
Nitrate of silver.....1 ounce.  
Distilled water.....10 "  
Iodize, and acidulate with nitric acid.

Intensifier.  
A. Bromide of potassium.....¼ ounce.  
Water.....4 "  
B. Sulphate of copper.....¼ "  
Water.....4 "

Mix equal parts A and B and pour on the film. When perfectly whitened, blacken with nitrate of silver, 36 grains to ounce of water. In place of the above method try a very slow grade of gelatino-bromide plate and develop with an excess of pyro, previously soaking plate for 3 minutes in solution of gallic acid, 3 grains to each ounce of water.

(4) P. H. asks how photographs are enameled. A. The ordinary way is to first prepare a sheet of glass by flowing over it a solution of wax or paraffine in ether, then rubbing it over with a dry cloth, which leaves a thin film of wax on the glass, then, when dry, in coating the glass with a thin, transparent plain collodion. This is allowed to partially set, and is then immersed in water until the greasy lines disappear. The dampened albumen print is then squeegeed face downward on the collodion film. When dry, by cutting around the picture with a knife, the print is pulled up at one corner, bringing with it the collodion film, which gives the fine glossy appearance so much admired. For further details see SCIENTIFIC AMERICAN SUPPLEMENT, No. 78, page 1062.

(5) J. C. asks how magic photographs are made, which appear when the paper or glass supporting the film is blown upon by the breath. A. The picture is printed and fixed in the usual way, but not toned; then it is bleached out with a solution of bichloride of mercury. It may now be made visible again by blowing on it with the breath, especially if the smoke from a cigar is mingled with the breath. The picture may also be reproduced by placing the print upon a pad of blotting paper saturated with hyposulphite of soda.

(6) J. H. and G. W. H.—The mottling of small pieces of iron by the case-hardening process has no peculiarities further than protecting the work from the oxidizing effect of air while in the process of heating and the rapidity of transfer to the water when ready for hardening. The process consists in packing the pieces carefully in animal charcoal (charred leather, scrap hoofs or horn), pulverized so as to allow it to pack closely in contact with the surface of all the articles, in an iron box (cast iron preferred), with a cover to fit closely inside, so that if the box is not full the cover will set in contact with the material. Have no articles touch each other; press the cover down and put a little white sand on top to prevent air passing in between the cover and box. Heat the box in a forge fire or furnace to a bright red heat: keep it at this heat for 15 minutes for small articles like gun lock work. Then take off the cover and seize the box with a pair of tongs; hold it over a tub of water, tip the box, and spill gently the contents (iron and charcoal) into a tub of water. The time of dropping the pieces into the water governs the depth of color. This must be had by practice. Turning the box over slowly and shaking clears the pieces