ENGINEERING INVENTION.

A practical improvement for traction engines has been patented by Mr. Benj. S. Benson, of Baltimore, Md. This invention relates to a combined differential gear and friction clutch designed so that power may be transmitted from a single shaft independently to two sets of wheels at different speeds and also so that power may be applied with a gradual strain instead of with a sudden jerk.

MECHANICAL INVENTIONS.

An improved type writing machine has been patented by Mr. A. G. Leming, of Waldron, Ark., the object being a more rapid manipulation of the type writer, and more exactness in its results. This is accomplished by absolutely exact mechanism without the adventitious aid of springs.

Mr. Alex. D. Clarke, of New York city, has obtained a patent for an ore concentrator, an improvement upon a patent granted to same inventor No. 276,775. This invention provides a new device for concentrating ore in placer mining, for washing out and separating the particles of gold and silver from the sand.

Mr. John Creagan, of Cleveland, O., has patented a machine for setting springs which is an improvement on a patent granted to Messrs. Creagan and Tyler in May. 1882. The present invention consists in certain improvements in the parts of the machine, whereby the working of the machine will be practically ameliorated.

A baling press, for cotton or hay, or other bulky substances, has been perfected by Mr. John S. Davis, of Frankfort, Ky., which will compress fibrous material by lever power, an ingenious combination of levers crowding it into a small compass. The object is to use light power—manual or animal—extending through a longer time than that of steam, which concentrates manual power in a short time, but giving out a large amount of useful force.

An improved safety stop for elevators has recently been patented by Mr. Eusebio Salom, of New Orleans, La. Perforated plates and horizontal pins are connected with the guides of the elevator, and the top cross beam of the elevator car is provided with safety hooks which are designed to fall by gravity and engage with these pins, in case the supporting cable with which the gravity hooks are connected becomes ruptured from any cause.

An improvement in circular saws has been patented by Mr. Geo. W. Stinebring, of Shreve, O. This invention consists in making the teeth, which are removable, in the form of a segment of a circle, and in making them concentric, both on the front and back edge, and further in preparing the notches of the saw in which they fit with serrations, to hold the teeth in any position in which they may be shifted to set them to the original gauge after they have been shortened by wear.

Mr. William H. Sterns, of Humboldt, Neb., has invented an improved churn, the object being to improve and simplify the construction of swing body churns in a manner to secure their more perfect balance in action and greater convenience in adjustment and operation. The invention consists in hanging the churn body in a yoke or frame suspended from the main frame of the churn, and in the arrangement with the yoke frame for the churn body of an open sided or bent yoke or bar, the axis of rotation of the latter, to cause a movement of the churn body in a circular horizontal orbit as the open yoke swings or rotates to the opposite side to balance the momentum of the churn body, the open yoke acting as a counterpoise.

An improved fastener for the meeting rails of sashes has been patented by Mr. William H. Bayles, of Montclair, N J. The object of this invention is to provide convenient and reliable means for fastening window sashes, and the invention consists in a window sash fastening constructed with two plates hinged to each other and provided with an interposed spring, and having a catch attached to one plate, and a latch hinged to the other plate, so that the latch plate will swing up when the latch is raised, and will be fastened automatically when swung down. The same inventor has also obtained a patent for a device for locking window sashes to prevent their being opened from without, and the invention consists in a window sash fastening constructed with two plates hinged to each other by a pin, and provided with a spring arranged to close the said plates, and with a pivoted button arranged to hold them open, so that the fastening will hold the sashes securely and can be readily fastened and unfastened.

AGRICULTURAL INVENTIONS.

Mr. Geo. W. Stacy, of Marietta, Miss., has patented an improved straddle row cultivator, which cultivator is so constructed, however, that it may be used also as a mid row cultivator, or to cut up the roots of small sprouts, briers, etc.

Letters patent have been granted to Mr. Eugene W. Vest, of Sedalia, Mo., for an improved seed planter. This machine, besides being built and constructed in a manner rendering it highly practical and efficient for the work for which it is intended, is provided with an improvement by means of which the depth of the furrow and drill may be readily controlled by the weight of the machine.

MISCELLANEOUS INVENTIONS.

Mr. Samuel Wilde, of Williams, Cal., has patented a heel for boots and shoes. This heel consists in a seamless shell of sole leather filled with waste scraps mixed with glue and pressed into the shell. The heel is to be attached to the insole of the boot or shoe by means of the ordinary nails or pegs.

Mr. H. Molendo, of New York city, has patented a device for furnishing a supply of water in buildings for extinguishing fires by an automatic pump, driven, either by a located steam engine, or by the weight of water from an elevated tank supplied from a regular source; the peculiarities of the device being the handy means of admitting the outflow of water to any one or all of the floors at will.

Mr. John Weiler, of Griggsville, Ill., has invented a new and improved road cart, the invention consisting of an improved arrangement of springs for mounting the seat on the cart, which is designed to be better adapted to neutralize the swing of the shafts by the horse than other arrangements; and the invention also consists of a spring contrivance for connecting the whiffletree to the shafts, to neutralize the jerks of the horse in pulling the cart.

Mr. Isaac W. Stemen, of Elida, O., has invented a new and improved railroad signal which consists in a revolving signal of targets by day and lamps by night, set on the top of the caboose or other hind car, and geared by belts and pulleys with one of the axles of the car truck, so that the direction of their rotation will show which way the train is running, and their velocity will indicate the speed of the train, and being at rest will show that the train is standing.

A combined folding table and cupboard has recently been patented, which consists in a lower frame provided with drawers which may serve as a bureau, and with a space above the drawers into which the extension table may be folded. On top of this frame is arranged a case provided with shelves upon which books or table utensils may be deposited. The inventor of this device is Mr. Joseph H. Bartine, of Etna, Mo.

Mr. Charles A. Barnes, of West Liberty, Ia., has obtained a patent for an improved tile laying machine. This device is provided with a mould and cutters for cutting away the sides and bottom of the ditch, and the mould board is provided for raising out the cut slice, and grooving the bottom of the ditch, while the tile laying attachment follows the mould board and lays the tiles in the ditch before the earth is permitted to cave in.

Mr. George W. Bowen, of Fort Wayne, Ind., has patented an improved horseshoe. This invention consists of a horseshoe gradually decreasing in thickness from toe to heel, the taper being on its under face, and provided with a continuous calk extending from heel to heel along the outer edge of the bottom of the shoe, and made integral therewith, this calk being flared outwardly to form an enlarged bearing for the foot of a horse.

Mr. P. F. Dean, of Watsonville, Cal., has patented an improvement in the seats for dog carts and sulky wagons to prevent the up and down jolt of the seat dependent on the movement of the horse. The device is the support of the seat on the arms of a semi-rotating vertical crank by means of a suitable arm. The device has also a swivel attachment by which the seat may be turned to the side of the wagon for convenience in getting in and out.

Mr. Herbert W. Kibbe, of Utica, N. Y., has patented a perpetual calendar of convenient form that may be made of sheet metal and of so diminutive a size as to be carried in the vest pocket. It is intended not only as a current weekly and monthly calendar, but as a means of forecasting the days of the week and month, and also of determining the exact date of those which have gone. It requires no mental or written calculation, a merely mechanical operation of turning a disk being sufficient.

Mr. Jacob Coover, of Chambersburg, Pa., has invented improvements in burial vaults to be formed in the bottom or lower part of graves, and the invention has for its object to provide a strong, durable, water tight, and cheap vault, and one which will take up little space and can readily be put in place. The invention consists, principally, of supports having shoulders and lips adapted to support and hold in place the coffin lid. The design is to protect the coffin from the superincumbent weight of earth, and to defend the coffin from desecration.

An intrenching implement for military use, consisting in a combined pick and spade, has been patented by Mr. N. Willoughby Wallace, of 3 Harley Place, Clifton, County of Gloucester, England. The handle of the spade is provided with a cross head in the form of a pick, which is sheathed and pointed with steel to enable it to be used for the purposes of a pick, while the shank and blade are of such form as to enable the implement to be conveniently used either as a pick or as a spade, and to be carried with ease as a part of a soldier's accouterment.

A hand clothes washer has been patented by Mr. Isaac T. Greene, of Milford, Conn., the design of which is to spare the hands of the washerwoman, and to facilitate the cleansing of clothes by rubbing on the ordinary corrugated washboard. The inventor uses a holder—a small box suitably constructed—which contains a receptacle for soap with a perforated bottom, and under the bottom of which is a series of rollers. By this means the hands need not come in contact with the corrugations of the washboard, nor be exposed continually to the alkali of the soap.

A neat folding hook for the reception of hats, bonnets, bundles, or any light articles is patented by Messrs. August Wode and Joseph Mifflin, Jr., of Jersey City, N. J., that is intended primarily for theater and concert room seats, but may also be adapted to other purposes where a protruding hook may be in the way when not in actual use. The hook is hinged under the seat or shelf, so as to fold up against the under side of the seat when not being used, and can be swiveled out and back, being held in any position by the action of a spring on an angular projection at the rear of the hook.

Mr. Albert R. Yount, of Yountsville, Ind., has invented a new an improved fire escape which relates to that class of fire escapes in which the persons are suspended by means of a rope or cable wound around a drum provided with a governor to regulate the speed. In connection with this invention a drum is mounted loosely on a shaft connected with a governor, regulating the speed, which drum is integral with another drum of less dimensions. On each drum a rope or cable is wound, said ropes being wound in opposite directions, so that when one is unwound the other is wound up, thus permitting the same escape cable to be used consecutively by any number of persons.

A very convenient adjunct to a step ladder to facilitate the depositing of fruit taken from the tree, either upon the ground or into a wagon or cart, has been patented by Mr. D. Van Trump, of Norborne, Mo. At one side of the ladder is arranged a slide way with a bucket connected with it in such a way, that it may be slid up and down by means of a windlass located at the top of the slide way convenient to the fruit gatherer. A wing is likewise connected with the upper end of the ladder, to enable the person picking the fruit to walk partly around the tree and pick more fruit without changing the position of the ladder than would otherwise be possible.

Some improvements relating to mechanical telephones have recently been patented by Mr. Harvey E. Huston, of Monticello, Ill. In this improvement the inventor has endeavored to provide an instrument in which the sounds will be reproduced more clearly and loudly than heretofore. The invention consists in forming the diaphragm of layers of metal or some fibrous material, and of providing a mouthpiece for the transmitter, so that the whole sound will act without obstruction upon the diaphragm. The invention further consists in forming the wire with strips of wire surrounded with rubber or fabric, and in providing a suitable insulator or support to prevent the vibrations being transmitted to the ground.

Mr. Stephen N. Howard, of Eatonton, Ga., has invented a poke for horses, mules, and other pastured animals that is intended to repress and render abortive their attempts at uplifting gates and loosening fence rails, while not hindering them from grazing. To a head stall, the check pieces of which are metallic straps, there is pivoted a forked bar extending in a single bar beyond the nose, to which is attached by a slide a weight, which may be adjusted as required by the strength of the animal. This projecting bar moves freely in an upward direction, but is made rigid and in line with the animal's nose, by means of rests in the head stall, as soon as the animal attempts to operate on fences by raising his head and "throwing" by the nose or the horns.

Mr. Richard Christie, of Truro, Nova Scotia, Dominion of Canada, has invented a new and improved fire escape, the object of which is to improve that class of fire escapes in which a car is guided on stretched cables and suspended by a rope passing over a pulley and down to a windlass. Two or more chains or cables are united by rounds forming a ladder. One end of the ladder is secured to the roof of the building, or is passed over the roof of the building and held securely on the ground, and the other end of the ladder is secured to a winch on the ground, by means of which winch the ladder can be drawn as taut as may be necessary. A car of sheet iron or wire net may be sent up by the winch, on a supplementary line, provided with a hook to engage with the principal cable and be lowered by means of a guide plate on the principal cable.

NEW BOOKS AND PUBLICATIONS.

AMERICAN NEWSPAPER ANNUAL. N. W. Ayer & Son, Philadelphia, Pa.

The publishers of this volume claim to give a list of all the newspapers of the United States and Canada, together with information regarding their circulation, date of establishment, distinctive features, advertising rates, and the population of the cities and towns in which they are published. In the first half of the book the States are grouped geographically, and the cities and towns alphabetically; in the other half the States are similarly arranged, but the counties are given alphabetically. The location, natural features, and the chief products form a part of the explanations. The publishers aimed to place at the disposal of the advertiser all the information he might need, and they have collected and conveniently arranged a mass of useful material. The characteristics of any section of the country, and its probable value to those seeking business, may be obtained at a glance.

ELECTRICITY AND ITS USES. By J. Munro. Illustrated by eighty-four engravings. The Religious Tract Society, London, England.

The author's object is to give the general reader some account of the many new applications of the electric current, avoiding minute details and technical terms. The first three chapters are devoted to frictional, or static electricity, voltaic and thermo piles, and induction, the latter subject being concisely and accurately treated and its importance in the practical uses of electricity pointed out. The remaining chapters are taken up with land and submarine telegraphy, the telephone and microphone, the photophone and telephotograph, the induction balance, dynamo electric machines, the electric light, power, and heat. While the principles of the dynamo and of the arc and incandescent lights are generally explained, the author's lack of space prevented anything but a running account of their various modifications. The same remark applies to the other divisions of the book.

MANUAL OF THE RAILROADS OF THE UNITED STATES FOR 1883. By Henry V. Poor. H. V. and H. W. Poor, publishers, 70 Wall Street, New York. Effingham Wilson, Royal Exchange, London.

This is a complete compendium of the railroads of the United States, giving their routes, lengths, debts, bonds, stocks, values, equipments, and an official showing of their financial condition. The scope of the book comprehends all the railroads in the States and Territories, with their foreign connections, and the accompanying maps delineate the routes and show the salient points on the roads. The volume is quite bulky, containing 1,055 pages, and is intended for office use and desk reference. It is quite exhaustive in its details of information.

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 the office. Price 10 cents each.

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

(1) G. A. S. writes: At present I have in use a rubber cloth carriage top which has commenced to leak on account of the coating having become warm. Would like to learn of some composition easily made or readily procured which may be applied to cover to prevent leakage. I have a small quantity of a solution of gutta percha in carbon disulphide. Would this answer? A. The rubber solution you speak of is intended to be applied with heat and rubbing with a hot iron burnisher. We donbt if you can repair the wagon top satisfactorily. Thick white lead paint would do except that it would make it too stiff. Use four pounds of lead to the pint of oil, so as to make almost a paste.

(2) J. H. L. asks what quantity of "oxygen gas" is used per hour in the "oxycalcium" light for magic lantern work. Also the size of jet to use, and pressure on gas holder. A. The amount of oxygen consumed in an oxyhydrogen or oxycalcium burner depends altogether on the amount of light required, that is, provided the burner is properly made. Two feet per hour ought to yield a fair light. Of conrse you can consume two or three times that amount. The pressure in gas cylinders ranges from 60 to 85 pounds.

(3) H. L. writes: We are looking for a paint to use on ice racks and around doors and on shelves of refrigerators which will cover up the smell of pine and give out no offensive odor. Can you help us? A. Zinc white in oil tinted with any of the ordinary colors, well dried, onght to make an acceptable finish for refrigerator Oxide of iron or Prince's metallic paint; is a verystrong and durable paint; it does not give off a disagreeable odor. It makes a good tint with zinc white. Chrome yellow is also good. These colors must be thoroughly dried to make them entirely odorless. If you cannot use oil, the only other substance that would probably answer your requirements is shellac varnish, 2 or 3 coats, drying each before the next is put on.

(4) E. K. asks: If you wished to warm a room by steam and the room is closed up, can you not raise the temperature of the room to a higher degree than the temperature of the steam at boiler pressure? Of course we mean heat by direct radiation through steam pipes. A. You cannot heat a room as hot as the steam at the boiler pressure. In drying rooms for japanned and rubber goods, a temperature is seldom obtained nearer than from 15° to 30° below the temperature of the steam in the pipes.

(5) C. F. N. asks (1) whether red rags will make white paper, or are red rags practically useless as regards paper making? A. Red rags are not used to make any other than the most ordinary grades of paper, although when capable of being well bleached they are made available by mixing with rags of a better grade 2. Again, is there any premium upon said subject? A. No premium on subject that we are aware of.

(6) F. J. F. writes: Will you please explain in Notes and Queries the processof photo-electrotyping? A. The various photographic processes as applied to printing are very thoroughly described in SUPPLEMENTS, No. 82, 143, 146, and 213, to which we refer you.

(7) J. G. from Hawaii writes: I doweled together the base and column of a marble monument with two iron half inch dowels, three inches inside, and I find that the iron rust has come through to the outside. Please let me know what I can use to take it out. A. Dilute mineral acids, such as hydrochloric acid, will wash out the iron rust; but if it has penetrated any distance, you will only injure the marble by attempting to better it, as marble likewise is soluble in the acid referred to.

(8) G. A. N. asks: 1. What is the best and lightest material to make balloons out of? A. Silk is best: linen will answer. 2. How is the material made waterproof and airtight? A. By coating it with varnish. See answer to query 13, SCIENTIFIC AMERICAN, June 9, 1883. 3. How large will a balloon have to be to carry 300 pounds, not including weight of ropes, net, and equipments? A. This can only be ascertained by consulting a practical balloonist. See SUPPLEMENT, No. 50, on the "Progress of Aeronautics."

(9) P. D. asks: 1. What per cent of gas tar is phenol in bulk? A. Percentage varies considerably with the kind of coal used to produce the tar. Calvert states that from English coals the average production varies from 3 to 14 pounds per 100 of tar. Other authorities state from 7 to 33 per cent. 2. How may it be separated from the other components? A. It is separated by fractional distillation and purification by treatment with alkalies, etc. 3. Is the process expensive? A. The process is not very expensive.

(10) M. A. asks how to prevent starch from becoming sour. A. Add a little oil of cloves or solution of salicylic acid to your starch when making it.

(11) G. B. T. writes: Will you please inform me how I can make an enamel upon zinc or other metals in white with black figures? Also, how I can prepare card board so as to render it impervious to the humidity of the air, and finish it with a smooth, glossy surface. The card board is white with black figures. I have first covered the printed board with hot starch, when dry flowed with dammar varnish. They turn yellow when exposed to the sunlight. The starch was to prevent the ink from running into the varnish. A. Calcine 100 parts lead and 20 to 30 parts of tin thoroughly. Melt 100 parts this mixture with 100 of white sand and 25 or 30 parts salt. When cool pulverize very finely. This gives a dead white enamel for the ground. The black can be formed by the addition of black oxide manganese or protoxide of iron. Apply to metal in form of a paste in water, to which a little glue has been added, and fire. Size your paper with a starch solution, and then varnish with white shellac instead of dammar.

(12) A. S. R. writes: I have some modeler's wax that is too hard; how can I temper it? How is the wax made? A. Modeling wax is made of a mixture of wax and lard. It may have other constituents, but the above are the regular ones. To make it, melt the lard and then add wax in small pieces until a sample cooled is found to have the right consistence. If too stiff, temper it with lard.

(13) G. B. C. writes: Will you please to give me the proportional increase required to make a hand electric machine similar to the one in No. 161 of SCIENTIFIC AMERICAN SUPPLEMENT, that will give twice as much of a current—the increase in number of wire and of turns, also the armature? A. Make the machine one-half larger. Wind with the same number of turns and with wire of the same size.

(14) L. L. Van L. asks for a recipe for dressing for ladies' kid leather shoes.

A. Gum shellac.....2 ounces.
Aqua ammonia .....1 ounce.
Water.....8 ounces.
Black aniline.....enough to color.

Heat the ingredients slowly together (except the aniline) until the whole is near boiling and the shellac dissolves. It may be necessary to add a little more ammonia during the boiling. Then add the aniline and water (enough to make the whole measure sixteen ounces).

(15) H. S. writes: 1. In current vol. xlix., No. 6, page 87, you speak of a new substitute for rubber, discovered by MM. Dankworth and Landers; can you tell me about how much it costs per pound? A. The article referred to is not yet in this market. 2. If two bar magnets are placed together, parallel with each other, and with opposite poles in contact, do they not become weakened or neutralized? A. No, the tendency will be to mutually strengthen each other. 3. Is it not best to place something between them to preserve their integrity? If so, what kinds of substance is it best to use, and what distance apart is it advisable to place them? A. Magnets are generally wrapped in oiled paper to keep them from rusting. It is not necessary to separate them to preserve their strength. 4. Is crystallized carbon, or diamond, a conductor of electricity? A. Diamond is practically a nonconductor of electricity.

(16) W. E. K. asks what is the best proportionof sulphuric acid and water to use with scrap zinc to generate hydrogen gas, and what quantity of gas will be generated? A. Use about one pound of acid to ten pounds of water. This is about equivalent to one measure of acid to five of water; 98 pounds of acid and 65 pounds of zinc give practically 350 cubic feet of hydrogen.

(17) G. B. G. asks what height water can be thrown through a one inch nozzle, 50 feet of 3 inch hose, attached to a hydrant of on foot diameter, the height of reservoir being two hundred feet. And is the ratio the same, or per cent of distance thrown the same under all heads? A. According to table given in "Box Hydraulics," *without* hose, height is 137 feet, but this is theoretical. According to experiments at Kingston (Jamaica), with 40 feet 2½ inch hose and seven-eighths inch nozzle, the height of jet was under a head of 156 feet, 85 feet and 84 feet; and with three lengths of hose, 64 feet and 62 feet. The result of experiments are so variable, that no reliable law or formula can be given for practical results. 2. At what height should a reservoir be placed to make the pressure sufficient for effective work in case of fire, with buildings three stories high? A. If your three stories are equal to total height of 34 or 36 feet, we think the head should not be less than 150 to 160 feet to throw an effective stream.

(18) C. C. V. asks: 1. Is there any known means of making one's hair permanently gray, by artificial means? A. We know of no means for insuring permanent white hair. 2. Can a white, hard compound be made either from caoutchouc or gutta percha? A. No satisfactory proces for producing perfectly white rubber or gutta percha is known.

(19) C. H. W. writes: Can you tell me how to remove the interior or bony portion of a cow's horn in making powder horns? A. Use dilute muriatic acid; also try the effect of heat and boiling water.

(20) T. M. W. writes: Can you give me some information in regard to the flux used in the process of zinc coating? The writer has made various trials, and has succeeded in doing very fair work, but not as good as the best; and the loss of metal from oxidation is so great that it is evident the right flux has not been used. A. The iron articles are cleaned if necessary by dilute sulphuric or hydrochloric acid, and with emery. They then are dipped in a saturated solution of chloride of zinc and salammoniac. Salammoniac is kept upon the surface of the melted zinc, and the iron articles are plunged into the melted metal through the salammoniac. This salt is the flux you ask for Do not have your bath too hot, and you will have no trouble. Sometimes one-sixth part of mercury and a very little sodium are added to the melted zinc. The latter should not exceed one two-thousandth of the zinc.

(21) J. E. B. writes: I have a set of ivory handled knives whose handles have turned yellow with use. How can the original whiteness be restored to ivory under such circumstances? A. Binoxide of hydrogen is used for bleaching ivory. It is also recommended to expose the ivory to strong sunlight under a glass covering. This will sometimes bleach it.

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