

Notes & Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers.]

- 1.—INDIA RUBBER BELTS.—Can an endless gum belt be made uniform in thickness and strength throughout? A substantial belt 7 inches wide and 125 feet in length is wanted.—S. S.
- 2.—DIMENSIONS OF AIR PUMP.—How large an air pump do I want, and at what rate of speed should I run it, to produce a pressure of 100 pounds per inch, the air to be discharged through a three eighth inch pipe, and the discharge pipe to be open all the while? How large an air chamber or receiver should I want? How much power would it take to drive such a pump?—O. O. W.
- 3.—FUTURE HUNTING PROSPECTS.—Can any one tell me what the West will be fifty years hence? Will there be plenty of game out there, and could a man make a living by his rifle? Also, if a person had a cartridge rifle, could he find plenty of that kind of ammunition out there now, or had he better get a rifle that would use both cartridge and loose ammunition?—O. K.
- 4.—WELDING STEEL.—What is the proper flux to use for this purpose?—I. A. C.
- 5.—OXYGEN IN SULPHURIC ACID.—What number of cubic feet of oxygen gas does it take to oxidize one ounce of sulphur to form sulphuric acid?—J. T.
- 6.—SLOWLY DRYING GLUE.—I am doing some joiner's work which requires the glue to set or dry very slowly. Can any of your correspondents tell me how to make it do so without injuring its strength?—J. H. P.
- 7.—TRANSFERRING PENCIL DRAWINGS.—How can I transfer a pencil drawing on paper to box wood or type metal for engraving?—J. H. K.
- 8.—ACETIC ACID.—Will some correspondent inform a subscriber how to make good acetic acid on a small scale?—F. O. R.
- 9.—FLAVORING EXTRACTS.—Will some one tell me how extracts of vanilla and lemon are made?—E. R. T.
- 10.—POWER OF HEAD OF WATER.—I have a fall of 19 or 20 feet water, only 12 by 2 inches; on a 20 foot wheel, what power will it give? Which will be cheapest and best, an overshot or turbine wheel? I want to build a stone dam; how thick should the wall be? The stones are small. Is there any mortar or cement that I can use at the foundation so as to prevent the escape of any water? Please tell me how to begin and finish the dam.—J. S. C.
- 11.—MOUNTING PRINTS.—I wish to know if wetting (as much as will be required for the purpose of backing in map style) will injure the color of a common lithographic print? If so, is there any other cheap method of preserving it? What is the most plant and best material for backing? What is a good varnish for the face of the print? Will soaking blue common ink writing? If so, is there anything with which either it or a lithograph may be treated to fix the colors? I have two lithographs and another paper, with considerable writing on it, which I desire to back and mount in map style.—E. B. W.

Answers to Correspondents.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 10 a line, under the head of "Business and Personal."

ALL reference to back numbers must be by volume and page.

- TEMPERING MINERS' PICKS.**—J. A. C. will find full directions on page 170 of Vol. XXV. of the SCIENTIFIC AMERICAN.
- STAINING GUN BARRELS.**—To S. G.—We have recently given full information on this subject. See pages 217 and 260 of the current volume.
- TEMPERING STEEL SPRINGS.**—To L. G.—Your question has been answered by several correspondents during the last few months. See pages 200, 249, and 313 of the current volume.
- J. C., of W. Va.**—The mineral you send is mica schist, of no value. No metal in it.
- W. O. H., of Miss.,** says: I enclose you an insect picked up in a room which had been for some time unopened. Please let me know what it is. Answer: The "insect" appears to be the puparium of a gay colored fly, whose "cat tailed" larva has a long respiratory tube. The species is *Merodon bardus* (Say).
- DIFFERENTIATION OF FOCI.**—How should the lenses of a portrait camera tube be set so that the chemical focus and the light focus will be coincident? Can a tube that has these foci at different distances be remedied? And how? I noticed a few days since, that, in taking a view of a house with a portrait lens, using a stop three inches in diameter, when the plate was developed there was a circle in the center of about three times the diameter of the stop, over which there was a greater deposit of silver than over the rest of the plate. How can this be prevented? Is there any combination of lenses that will present the image on the plate in the camera in its true position, that is, that will form a non-reversed picture? If so, what is the combination?—X. P. M. Answer: When the lenses of your portrait camera are truly achromatic, the chemical focus and the light focus will coincide; if they are not truly achromatic, or are so only in name, by the defective relations of the curves of the flint and crown glass, they cannot possibly be made to coincide. This is entirely the business of the maker of the lenses; you cannot correct this by setting. All that you can do is to find out how far the chemical focus is in front of or behind the light focus, and when you have focused with the ground glass, to set your prepared plate so much forward or backward. In some cameras, the maker has done this by means of difference in the position of the ground glass and the plate holder, and you may correct your camera box in the same way. The new excellent landscape lenses of Lindmayer of Philadelphia, and many German lenses made in imitation of his, are not achromatic, and it is not claimed that the two foci coincide, but the picture is made in the chemical focus. The spot in the center of your picture, which you so admirably describe, is well known among photographers and called "the ghost;" it is a common defect in the lenses and cannot be prevented; all that you can do is to modify things so as to make your ghost as slight as possible. When the spot is between the lenses at the right place, the ghost is at its minimum. There are combinations for making a non-reversed picture, namely, a metallic reflector (in front of your lenses, placed at an angle of 45° with the axis of your camera tube), the so-called prism with total reflection, or a mirror inside the camera box, etc.

PARIS GREEN.—Query 2, page 330.—Paris green is known in chemistry as Scheele's green. It is an arsenite of copper, and is made by dissolving one part of common white arsenic (arsenious acid) and three parts of carbonate of potassium in fourteen parts of water and adding the mixture to a boiling solution of three parts of sulphate of copper (blue vitriol) in forty parts of water. The Paris green is precipitated.—L. L. F. G., of Mass.

CLEANING INSTRUMENTS.—To H. O. M., query 19, page 297.—If the lacquering is badly spotted, clean it off with strong alcohol, and then polish the brass or German silver with the following paste by means of flannel and a little water, and polish off with clean chamois leather or cotton cloth and a little whitening, after which you might revarnish with shellac dissolved in alcohol, colored with a little dragon's blood, which can be got from any apothecary: Soft soap, 3 ounces; sweet oil, ½ ounce; turpentine, ¼ ounce; powdered rotten stone, 4 ounces; finest flour emery, 1 ounce; fine powdered crocus of ahtimony, ½ ounce. Melt the soap, oil, and turpentine together, add the powders, a little water to make a stiff paste, and mix well.—E. H. H., of Mass.

CONCRETE WALLS.—T. D. D., query 13, page 297.—Boil linseed oil over a fire for two or more hours until it forms on cooling a tough viscid mass. If while hot, or thinned a little with benzine, this is painted over the walls, I think you will find your trouble relieved, as the composition will form a perfect waterproof coating. In boiling the oil take care that the fumes do not catch fire; but if they do, put a sheet iron or tin or a thick wet mat or piece of carpet over your pot; so shut out the air and extinguish the flames. On no account throw in water. Be provided and ready for the emergency.—E. H. H., of Mass.

BENGAL SIGNAL LIGHT.—Query 2, page 313.—A white Bengal light, very powerful, is composed of saltpeter, 32 parts, sulphur, 10 parts, antimony, 3 parts, and slacked lime, 4 parts.—A. V., of Mass.

SULPHATE OF MERCURY.—F. G. V., query 1, page 297, may dissolve the metal in diluted nitric acid, and precipitate the sulphate from the solution by the addition of sulphuric acid.—E. H. H., of Mass.

GALVANIZED IRON VESSELS FOR MILK.—W. P. T., query 7, page 297, will find that the lactic acid in the soured milk or cream will act upon the zinc surface of the vessels, thus rendering the fluid poisonous. Earthen or enameled iron pans are every way better (excepting the liability to breakage) than zinc or tin. Polished iron is not so easily acted upon as the two former metals.—E. H. H., of Mass.

GALVANIZED IRON PIPES.—B., query 11, page 297, would be less liable to occasion zinc poisoning if the lead and brass connections were out of the way, for they in fact will act as the other element of a galvanic battery, the water forming the electrolyte and taking up the zinc. The amount of action of the water upon the zinc will depend partly on the salts it has in solution. Total prevention of the contamination of the water by the zinc will be almost impossible, but constant changing will lessen the evil. Antidote for zinc poisoning: Clear the stomach by an emetic, then use albuminous drinks, and the administration of tannin in ten grain doses.—E. H. H., of Mass.

PREPARING FABRICS FOR PAINT.—To F. O. L., query 21, page 203.—Paint the cloth with thin flour paste, and allow to dry. It need not render the cloth very stiff.—E. H. H., of Mass.

GROVE'S BATTERY.—Query 10, page 313.—The zinc cylinders of a Grove's battery should be amalgamated with mercury. All that is necessary is to clean them by immersing them in dilute sulphuric acid of the same proportion as that used in the battery (eight parts water and one of acid is good), and then pour over them mercury, keeping them constantly wet with the acid. Sometimes a little rubbing with a coarse rag will hasten the amalgamation. When once coated, a little mercury kept in the cup with the zinc will keep them bright. The zinc cylinder should have about twenty-four times the area of the platinum. J. C. G. will need for his arrangement a strip of platinum 8 inches long and ¼ inch wide, if his acid touches only the inside of the zinc, and twice as wide if it touches both sides. To give needed strength, however, the platinum should be at least ¼ inch wide, and should extend nearly to the bottom of the porous cup. The porous cup should be as large as can be put into the zinc cylinder readily.—L. L. F. G., of Mass.

PRESERVATION OF TELEGRAPH POLES.—H. R. R., query 9, page 313.—I have for some time been paying attention to this; and my opinion is that neither tarring nor charring them is done with satisfactory results. The best mode of preserving them is coating their ends with soluble glass. This method is not very expensive, and is proof against worms, as they cannot make their way through the glass; it is also proof against the decomposition of wood by moisture, as soluble glass does not melt at any ordinary temperature. If H. R. R. were to try this method, I think he would find it answer. Any chemist will tell him the mode of preparing soluble glass.—C. A. S., of O.

GROVE'S BATTERY.—Query 10, page 313.—J. C. G. is entirely wrong in supposing that the amalgamated zinc for a Grove battery is a mixture of zinc and mercury. The zinc is merely coated with mercury to prevent rapid and uneven action of the acid upon the zinc. Plunge the zinc in a bath of dilute sulphuric acid, dip it into a vessel containing mercury and water so that the mercury may cover the whole zinc; then, with a stiff brush remove all superfluous mercury. This is amalgamated zinc. His zinc cylinder should be open at both ends. The porous cup need not be larger than two inches in diameter for the size of zinc named. Platinum a quarter of an inch wide, thick as ordinary writing paper, is sufficient. He can buy a cell much cheaper than he can make it.—S. J. H., of Ala.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

APPARATUS FOR SUPPLYING LOCOMOTIVE TENDERS WITH FUEL.—Henry C. Land, of Gardenville, Miss.—This consists of a platform or frame, on which the wood or coal is placed. To its lower side, at or near its central line, is pivoted the upper end of a frame, by which the platform is supported. The lower end of this frame is pivoted to a base frame or other suitable supports. Inclined rods are pivoted to the forward part of the lower side of the platform. The lower ends of the inclined rods are pivoted to the base frame, a little in the rear of the lower end of the pivoted frame, so as, when the frame and platform are swung forward, to tip or incline the platform and discharge the fuel into the tender. A strong upright frame is rigidly attached to the base frame just in the rear of the swinging frame, and by various appliances attached to the former the movements of the latter are controlled. The apparatus is designed to be placed at the side of the railroad track in such a position that the fuel may be discharged from the platform directly into the tender standing upon the track.

PICKLE AND CRUET STAND.—Thomas Leach, Taunton, Mass.—1st. The invention consists in a new pickle stand, provided with a hollow seat for pickle vessels, attached to and placed between two uprights, and provided also with a horizontal flange on which is fastened a vertical handle that straddles said hollow seat diametrically; 2dly, in extending the said horizontal flange, and recessing the extension so as to form a compound pickle and cruet stand; and 3dly, in combining, in one article of table furniture, a pickle and cruet stand.

WASHING MACHINE.—William G. Knowles, Jamestown, R. I.—This invention relates to a new washing machine in which a reciprocating slotted washboard is arranged to move on spring rails under and against friction rollers that hang in a spring frame. The goods pass down through the slot in the washboard into the suds, and are drawn through the washing apparatus by the friction exerted against the rollers by the reciprocating washboards.

WINDOW BLIND SLAT.—Alois Kohler, Williamsburg, N. Y.—This invention relates to the peculiar form of the slat. It may be made with any suitable molding upon its face. In cross section, the lower side of the slat presents a curved groove in front and a projection or heel in the rear; the upper side presents a tongue and a rear recess. These parts correspond, and will fit into each other when the slats are placed one over the other, forming a perfect joint.

APPARATUS FOR ELEVATING AND IMMERSING VESSELS.—Justin Jacobs, of West Salem, Wis.—This invention relates to a new device for application to river steamers, canal boats, and other vessels, and has for its object to prevent their sinking in case of a dangerous leak, and to cause their submersion in case of fire. It consists in the arrangement of vertical slides, which extend through the bottom of the vessel and are let down to serve as supports for the same on the ground whenever there is danger of the vessel sinking, also in the combination of these elevators with gates, which, when opened, let water into the vessel to sink it in case of fire.

ARMORED CAN.—William F. Thompson, of Toledo, Ohio.—This improvement consists, first, in armoring sheet metal cans with wood to protect the thin metal from injury in handling and transporting, by fastening side, bottom, and top pieces, or boards to the can by means of clamp plates, soldered or otherwise fastened to the corners of the can, and the ends bent over the edges of the boards after they are applied, whereby much is saved in the cost of the wood case or protecting armor, which up to this time, has been first made into a box, into which the can was placed and inclosed by a cover; and, secondly, it consists of an arrangement of the nozzle in one corner of the can, which is sloped off to make room for arranging it so that the top will not rise higher than the top of the can, to admit of so applying the armor on the top.

TOBACCO DRYING HOUSE.—John C. Streeter, of Hinsdale, N. H.—This invention relates to the process of drying tobacco and other articles, and consists in the provision made for suspending the article to be dried, and in the use of metallic supports, connected with the building frame. The suspending wire is bent round the rod so as to enclose it in a loop, and the two ends of the wire are passed around the tobacco and again bent at an acute angle over the top of the rod. These metallic supports or rods are placed at proper distances apart, and are arranged at right angles with each other, so that they support the frame in each direction.

GRAIN SCREEN.—David D. Schamp, of Pleasant Run, N. J.—This invention has for its object to improve the construction of the delivery spouts of thrashers and grain separators, so as to more thoroughly clean the grain before it is delivered into the receiving box or half bushel, and which shall be simple in construction and convenient in use. The spout is made with flanges along the upper edges of its sides to adapt it to be slipped into a groove formed for it in the shoe of the machine, so that it may be shaken by and with the shoe. The bottom of the spout is made of wire cloth or perforated sheet metal, to form a screen through which the dust and fine seed may escape, while the grain passes down the screen and escapes from the outer end of the spout. If the spout were left open, the part of the grain that fell upon it near its lower end would scarcely be screened at all. To remedy this a plate is placed, in the upper part of the spout near its lower end, to receive the grain and guide it to the upper part of the screen, so that it may pass over a longer portion of the screen. The outer end of the spout is extended fourteen inches and has a screen formed in or attached to the inner part of its bottom, of such a coarseness as to allow the grain to pass through, while the straws, heads, etc., which may be in the grain will slide over the screen and will drop from the outer end of the spout.

BALING PRESS.—Commodore J. Barney, of Rockport, Ind.—This invention has for its object to furnish an improved press for baling hay, straw, cotton, and other substances required to be put up in bales, and which shall be simple in construction, convenient in use, and effective in operation, enabling the work to be done much quicker and consequently much cheaper than when an ordinary baling press is used. The upright frames, which form the baling box, are securely connected by cross bars between which the doors for the removal of the bale are placed. Two followers work up and down toward and from each other in the baling box. To their outer sides are pivoted, respectively, the inner ends of bars, the outer ends of which are pivoted to levers. The outer ends of these levers are pivoted to the base frame and top frame near the outer vertical frame, and their inner ends are connected by a rope arranged with suitable machinery for compressing them. By this arrangement the levers operate upon the followers in the manner of a toggle joint, the bars coming nearer and nearer to a vertical position, and thus acting with more and more power as the bale becomes more and more compressed.

PUNCH AND DIE FOR FINISHING UMBRELLA STAFF COLLAR.—Robert Marshall, of Philadelphia, Pa.—The objects of this invention are to lessen the hand labor now required to finish umbrella staff collars in the lath and to secure their being made to a standard size, which is accomplished by finishing the exterior of the casting in dies, and sizing the hole by means of a painted mandrel rising through the lower die.

SPADE.—Jeremy Lake and Andrew W. Elliott, of North Easton, Mass.—This invention relates to a new spade which will enter the ground with greater ease than those now in use. A notch is cut into the blade of the spade at the middle, and extends from the lower edge about half way up the length of the blade. The blade has thus the shape of an inverted letter U. Its lower cutting edges may be slightly rounded, or straight. A spade thus made will, with less difficulty, cut through the ground, and will crumble the soil with less effort than the full bladed spades, though it has sufficient surface not to break the clods while it supports the same.

SOLDERING TOOL.—John A. Tillery and Samuel A. Ewalt, Baltimore, Md.—The invention consists: 1st, in making a soldering tool adjustable radially from a hinge joint, in order to adapt the same tool to be used with caps of varying size; 2dly, in moving said tool out and in, and fixing it at the same time, at any point of adjustment, by means of a loop headed screw through which passes the holder. The advantages of this tool consist: 1st, in the arc shape by which it can be seen at a glance what point has been left unsoldered or imperfectly soldered. 2dly, in the facility with which such defects can be remedied without removing the tool; 3dly, in the option that it allows of using either wire solder, or the cheaper drop solder, thereby saving one half the expense.

ILLUMINATOR.—Chas. F. Jacobsen, New York city.—The invention consists in combining glass plates, a flanged metallic case, a flanged metallic rim, two concave reflectors and a pair of burners, so as to form a new double night sign. By this construction the name of the business man and his special occupation or class of goods are displayed with great clearness and the attention of the public unflatteringly attracted.

PLANTER.—Weiss Beall, of Hainesville, W. Va.—The invention consists in introducing certain mechanical elements into the train of mechanism which connects the axle with the seed slide of a planter, by which the number of hills planted may be indicated on a dial with which it is combined. This implement is quite ingenious, but cannot be fully explained without an engraving and lengthy description.

COTTON PLANTER.—John A. Pope and William L. D. Pope, of Charlotte, N. C.—This invention has for its object to furnish an improved machine for planting cotton seed, distributing guano or other fine fertilizers, which shall be simple in construction, convenient in use, and effective in operation. Its principal features are the combination of a perforated platform, plates and feeder within the hopper, together with a stirrer, by which the seed or fertilizer is stirred up and made to pass through the holes in the plates on its way to the discharge spout. The seed is covered by adjustable covering plows.

REVERSIBLE SHADE FIXTURE.—William B. Hazzard, of Philadelphia, Pa.—The object of this invention is to permit the adjustment of window shades in either direction, so that a shade can be placed opposite any one part of a window wherever it may be required. The invention is more particularly useful for photographic establishments, hothouses, etc., where the rays of light are to be controlled with great exactness. It consists in the arrangement of a sliding spring roller supported on wire tracks and connected with a cord, whereby it can be drawn up, while the lower end of the shade has another cord, whereby it can be drawn down.

CALNDAR.—Robert C. Ogden, of New York city.—This invention relates to calendars which have a sheet, leaf, or tablet for each month, hinged or fastened together and to the back, so that any one month may be exhibited to view by dropping that or another leaf, sheet, or tablet down; and it consists in forming the hinge or connecting device of a single wire, bent at the ends into loops of a peculiar form standing at right angles to the wire. By this construction, the calendar will rest flatly against the wall when it is hung up, and the sheets can be attached and moved much easier than if plain rings were used.

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How Can I Obtain a Patent?

the closing inquiry in nearly every letter, describing some invention which comes to this office. A positive answer can only be had by presenting a complete application for a patent to the Commissioner of Patents. An application consists of a Model, Drawings, Petition, Oath, and full Specification. Various official rules and formalities must also be observed. The efforts of the inventor to do all this business himself are generally without success. After great perplexity and delay, he is usually glad to seek the aid of persons experienced in patent business, and have all the work done over again. The best plan is to solicit proper advice at the beginning. If the parties consulted are honorable men, the inventor may safely confide his ideas to them: they will advise whether the improvement is probably patentable, and will give him all the directions needful to protect his rights.

How Can I Best Secure My Invention?

This is an inquiry which one inventor naturally asks another, who has had so no experience in obtaining patents. His answer generally is as follows and correct:

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Preliminary Examination.

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To Make an Application for a Patent.

The applicant for a patent should furnish a model of his invention, if susceptible of one, although sometimes it may be dispensed with; or, if the invention be a chemical production, he must furnish samples of the ingredients of which his composition consists. These should be securely packed, the inventor's name marked on them, and sent by express, prepaid. Small models, from a distance, can often be sent cheaper by mail. The safest way to remit money is by a draft, or postal order, on New York, payable to the order of MUNN & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents.

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BOOT FOR HORSES.—Patrick Murray and Frederick Koch, of Morrisania, N. Y.—This invention has for its object to provide a yielding but nevertheless powerful boot for horses, whereby the muscles and tendons in the lower limbs near the hoof will be protected. A strap is made of leather, or other suitable material, long enough to fit around the horse's leg, and as wide as the section to be protected is long. A cushion is formed in the strap, and a section of rubber or other equivalent elastic material also secured therein. The cushion, which is made of suitable soft material, projects on the inner side of the strap, and is, by means of the elastic, drawn against the portion of the horse's leg which is exposed to the strain. Being thus held in contact with the parts most exposed, the cushion serves to brace or sustain such parts and protect them from injury. The strap is, by buckle, buttons, or otherwise, fastened around the horse's leg. The elastic makes it also self-sustaining. The device can also be used as an "interfering boot," to prevent the animals from injuring their limbs by striking them against one another.

APPARATUS FOR TEMPORARILY INCREASING THE PRESSURE IN GAS PIPES.—George S. Dunbar, of Pittsfield, Mass.—This invention furnishes an improved device for attachment to the pipe leading from the gas holder to the street main, or from the street main to the building, to enable the pressure to be temporarily increased. The drip box or trap attached to the main pipe is provided with a valve and a compressing apparatus in the following manner: The end of the part of the pipe that leads to the gas holder is provided with a valve which opens into the drip box. With the top of the drip box is connected an open pipe which passes up the central part of a cup or receiver, in which is placed water or other liquid to serve as a seal to the open bottom of a gas holder placed in it. With this construction, when the holder is raised, it will be filled with gas at the same pressure as it has in the main holder and in the pipes. When the holder is forced down, the gas in the holder will be forced out, closing the valve and temporarily increasing the pressure in the pipes, so as to operate as a device for lighting and extinguishing street lamps and burners.

DOOR CHECK.—William Overton Clough, of Lexington, Ky.—This invention has for its object to furnish an improved device for checking a door when opened, and holding it while open, so that it cannot swing about and slam. The box or case of the device is made in two parts. One part is made thick, and is recessed to receive a catch bar. The other part is made thin, and is designed to cover and protect the catch bar. The inner end of the catch bar is rounded off, and fits into a round recess in the body of the thick part. Upon the forward side of the catch bar are formed two catches. The forward side of the forward catch is inclined, so that when the door strikes against it the catch bar may be pushed back, allowing the door to pass the catch. The other or rear projection is intended to stop the door after it has passed the first catch. Upon the forward end of the catch bar is formed a toe piece, which projects through a slot in the end of the case, so that the catch bar can be readily pushed back with the foot to release the door and allow it to be closed. The catch bar is held forward by a coiled wire spring. The case should have holes or lugs to receive the screws by which it is secured to the door. The door has a small metallic plate attached to it, projecting a quarter or half an inch, which is designed to operate upon the catch. This enables the holder to be made smaller, and consequently cheaper, than it could be if it had to operate upon the body of the door itself.

LAND ROLLER.—Holloway W. Matthews, of Frenchtown, N. J.—This invention relates to a new manner of connecting the back frame of the third roller to the main or front frame holding the two front cylinders of a land roller. The object is to permit the application of a limbered tongue, whereby much strain is taken from the horses' necks. An L shaped bar connects the front and back frames. This bar has a long horizontal arm which is swiveled in the middle of the front frame, and extends backward under the middle of the back frame. A short vertical arm projects upward from the same, and is swiveled in the front of the back frame. This arrangement permits the frame to swing to either side on the short arm, and to incline to either side on the long arm, while vertically it is rigidly connected with the front frame. Up and down the frames will swing as though the two were one, while in every other direction the back frame has independent play. The tongue can therefore be hinged to the frame.

LIFTING JACK.—R. T. Smart and R. T. Smart, Jr., of Troy, N. Y.—This invention consists of a stand, of any suitable kind, with a long vertical slot in the upper part, and a series of transverse notches in one side crossing the slot. A lifting bar, having one end fitted to work freely in the slot, is connected, by a pivot pin, with a pair of links, one on each side, which pin projects at each end beyond the links to lie in the notches. These links extend downward in the slot, and through to the other side, and have a lever suspended in the lower ends by a pin projecting at the ends to bear against the side of the stand, opposite the one having the notches, to hold the lever against being forced back by the weight. The short arm of the lever curves upward slightly, and is rounded and shod with a metal strap or plate to act against the lower side of the lifting bar, which lies upon it. The lifting bar has a notch on the under side, into which the end of the lever comes when the load has been lifted high enough, and by which the lever is locked self-actingly, to sustain the load without other fastenings, but so as not to prevent being unlocked or disconnected readily when the load is to be let down again by the raising of the long arm of the lever. The lifting bar and lever are readily adjusted to the height of the axle or other load to be lifted by shifting the pin to the different notches.

ASH SIFTER.—George F. Millard, of Pittsfield, Mass.—This invention consists of a wide flat bottomed sieve, with oval sides and open top, suspended on a cranked shaft, which drops, through slots, from the top of a case into bearings in two sides of the case, low enough for a cover of the case to close down and confine the dust while the sifting is going on. When the ashes are sifted out, the sieve is taken out of its case to empty the coal remaining in it. The ashes which accumulate in the bottom of the case are discharged through the top from time to time, as required, by turning the case over. The sieve is swung forward and back by the crank, and, by reason of its flat bottom and oval sides, gives a quick forward and back motion to the contents, and as quickly arrests the same by the oval sides in a manner well calculated to do the work quickly.

LAMP SNUFFER AND EXTINGUISHER.—Marcus L. Battie, of Bainbridge, Ga.—This invention consists of a snuffing blade, which is mounted on the top of the vertical portion of a cranked wire pivoted near one of the narrow sides of the wick tube, in the vertical plane of the largest diameter of said tube, and having a handle portion projecting outward from the base of the lamp top for swinging the blade over the top of the tube and back again for snuffing it when required; the wick being first drawn down slightly, so that only the completely burned portion will be snuffed off. The extinguisher consists of a little plate hinged to the rear of the snuffing plate, and curved on the other edge, so that when the snuffer plate is moved over the top of the tube it will swing upward, unobstructed by the cone of the burner, to the horizontal plane of the snuffer and be moved over the flame so as to extinguish it; and when the snuffer is moved back the said extinguisher will swing down again, so as not to strike against the cone or the supports thereof, and thereby obstruct the complete withdrawal of the snuffer.

BREAD CUTTER.—Samuel H. Martin and John S. Williams, of Mount Vernon, N. Y.—This invention has for its object to furnish an improved bread cutter, simple in construction and effective in operation, enabling the freshest and softest loaves to be easily and smoothly cut, and which may be also used to contain knives, forks, spoons, or other articles required about a table; it consists of a rectangular box, which is divided into three compartments by partitions. The rear partition extends up to the top of the box, and to its upper edge is attached a narrow board, to the edges of which are hinged the covers. To the front cover, near its rear or hinged edge, is attached a flange to rest the loaf of bread against while being cut. In one side of the box is formed a narrow compartment to receive the knife, the edge of which is concave. To the forward or free end of the knife is attached the handle by which it is operated. The rear end of the concave edge of the knife is made with a sharp angle, which may be forced through the crust in beginning the cut. The rear end of the knife is made wide, and to the opposite sides of its lower part are pivoted the lower ends of two short parallel bars, the upper ends of which are pivoted to the sides of the boards that form the knife compartment or slot near their upper edges. This construction gives the knife a freemovement, enabling it to operate

upon the bread with a drawing cut. The device may also be used for shaving dried beef, which may be cut readily and quickly by giving the knife a sawing movement.

CAR COUPLING.—Courney S. Servoss, of Wilmington, N. C.—This invention consists of a pair of jaws within the drawhead, closing together or nearly so behind their pivots by the action of springs to engage behind the shoulders of the coupling bar, which couples with them self-actingly when the head and shoulders are forced in beyond the end of said jaws. These jaws are so pivoted in cavities in the drawhead that the drawing force is expended on said cavities and not on the pivots of the jaws, and they are provided with arms projecting through slots in the sides of the drawhead, which are acted on to open the jaws and uncouple the car by inclines on vertical bars hanging one on each side of the drawhead from a cross bar, to which a lever is attached extending toward the side of the car, where it can be reached without entering between the cars; and this cross head rests by a vertical rod on the end of the coupler to hold it level to enter the drawhead of another car; also, to cause the uncoupling of the cars self-actingly in case one runs off.

BALANCED SLIDE VALVE.—Charles H. Hutchinson, of Concord, N. H.—This invention relates to that class of balanced valves which are made in two parts, one working on the valve seat and the other on the under side of the top of the steam chest, to prevent too much down pressure, and one of the parts working in and out of the other steam tight. The first part of the invention consists in having the parts of the valves thus working together of rectangular form, corresponding to the flanges, so that the down pressure will be alike throughout the valve from end to end. The second part consists of a novel arrangement of the packing for said parts, whereby it is adapted to such forms, and may be accurately fitted in a simple and economical manner; and the third part consists of the application of an exhaust valve, which opens to withdraw the steam from the interior space of said slide valve in case the packing leaks, but which closes when steam is shut off and the engine continues to run.

TOBACCO BOX.—Wilson C. Thomas and Edwin T. Pilkinton, Richmond, Va.—The invention consists of a tobacco box having body formed of a cylindrical sheet of isinglass, and bottom and top of stiff paper, flanged so as to embrace and support the body. It forms a box cheap, easily made, and yet strong enough to bear handling and transportation.

SOLDERING IRON.—Herrman S. Saroni, Cincinnati, Ohio.—The invention consists in providing a soldering iron with a hydrocarbon reservoir, a vaporizer, a combination socket, and means for expelling the fluid in the reservoir by elastic force.

SOLDERING IRON.—John A. Tillery, Baltimore, Md.—The invention consists in centering the soldering tool with a rod which has an end tube provided with a side aperture, so that while the soldering tool is itself enabled to move in a perfect circle, the air from within the can can still freely escape.

PREPARING HORSE RADISH.—Joseph D. Husbands, Jr., St. Louis, Mo.—This invention consists of a new article of manufacture for food, medicinal, and other purposes, the same being desiccated and powdered horse radish, either alone or in combination with other condiments of salt, pepper, mustard, or spices, or other articles that will improve its flavor. The roots are desiccated in any approved way, and then ground or pulverized by any approved means, and packed together with the said condiments or not, as wanted.

WASH BASIN.—Jordan L. Mott, Mott Haven, N. Y.—This invention consists of a water closet and wash basin combined in one apparatus for use in prisons. The water closet basin and the wash basin are hinged together so that the wash basin rests on the top of the water closet basin and forms the cover thereof when in the position for washing; but when the water closet basin is to be used, the wash basin swings up and backward. This plan is calculated to economize considerably in the cost of plumbing, and simplifies the apparatus considerably, which is desirable for prisons and institutions.

PIPE WRENCH.—William C. Westerfield, Fairbury, Ill.—This invention relates to a new self-acting wrench for cylindrical bodies, and consists in the combination of serrated jointed jaws with a slotted shank in the operating lever, wherein the end of one of the jaws is allowed to slide and to thereby obtain the desired self adjustment. When the lever is moved upward it brings the serrated inner faces of the jaws nearer together, thereby grasping whatever object is between them, be the same cylindrical or of other form. The motion being continued, the object will be turned with the instrument, as intended. When the instrument is reversed, it will operate when the lever is swung downward. The invention is also applicable to the moving of railroad cars and other purposes.

BABY WALKER.—George Euell, Guttenburg, N. J.—This invention relates to a new construction of baby walker, and consists in making the same of two jointed annular frames connected by upright stays. Each of the rings is made in two equal parts, that are hinged together and locked at their opening ends by suitable spring catches. The lower ring is supported on legs which are rigidly connected with it, and which may also extend up to the upper ring. Caster wheels are applied to the lower ends of the legs. A handle, cushioned at the ends, is applied to the upper ring. A seat is connected with the lower ring, and made vertically adjustable, by means of a screw, to the size of the child. The rings are swung open whenever the child is to be inclosed, and are then locked together, confining the child, but allowing it full freedom of motion and action.

MARKING POT.—Jerome L. Tarbox, New York city.—This invention has for its object to furnish an improved marking cup, and is so constructed as to serve as a can for the ink and a cup for marking. Over the ink reservoir is a sponge compressed between two perforated metal plates. On this the brush may be rubbed when required, while the superfluous ink flows through into the reservoir. It is a convenient article.

FUSE.—George F. James, Manchester, England.—This invention relates to an improved fuse and a machine for making it, which cannot be explained in detail without the aid of a drawing. A machine similar to the ordinary circular braiding machine is employed, and is supplied with a hollow central spindle, above which is a self-acting feeder for placing the powder or other explosive compound in the interior of the braid. The work is drawn down the hollow spindle, instead of being passed upward as in ordinary braiding.

STEAM GENERATOR.—William V. McKenzie, Rahway, N. J.—This invention consists of a vertical cylinder boiler with vertical flues mounted in a sheet metal cylindrical shell with a furnace below; the cylinder is larger than the water boiler, so as to have an annular fire space surrounding it; the shell is jacketed on the sides above the surface and at the top, to economize the heat; the whole constitutes a simple, cheap, and efficient portable steam generator for cooking food for stock, and for other purposes.

HANDLE STRAP FOR TRAVELING BAGS.—Arthur Alexandre, New York city.—This invention has for its object to furnish an improved fastening for the handle strap for which letters patent were granted to the same inventor September 26, 1871. The strap is secured to the bag by rings, and is long enough to pass over the shoulder. In the center is a short length of strap to make the handle part thicker, and at each end of the thickened part is secured a short strap at right angles to it. The end parts of the long strap are doubled and carried through the rings up to the middle, forming a triple ply. The short straps are then passed round the long strap and fastened by eyelets to buttons on the long strap. To change the strap from a hand strap to a shoulder strap, all that is necessary is to unfasten the fastenings, when the weight of the bag will draw the folds of the strap through the rings, and expand it to its entire length.

RAILWAY TIE.—Edward J. Fenn, of Medina, Ohio.—This invention has for its object to furnish an improved railroad tie, which shall be so constructed as to form a continuous road bed, which shall be stronger and more durable than ordinary and form a smoother track; it consists in the construction following: Two inch planks of the length of ordinary ties are set on edge and arranged in pairs, the ends of the planks of each pair being securely bolted or spiked to the opposite sides of blocks twelve inches long. The outside planks of each adjacent pair are bolted or spiked to the opposite sides of blocks eighteen inches long, which are arranged upon the line of the rails, and are designed to have the rails bolted to them. This tie would have much more ground surface than the ordinary tie, and would consequently be much less liable to settle or get out of place.