

Build the brick lining an inch clear from the stone wall, and ram the space with equal parts coarse sand and Portland cement as you build the courses, so that you will have a solid and uniform portion of Portland cement concrete. The bottom should also have a continuous partition of the concrete under the brick floor.

(53) F. L. B. writes (1) for a solution that will make either leather or India rubber adhere to goloshes. I have tried hyposulphide of carbon and gutta percha, but this won't act. A. Dissolve a quantity of gutta percha in chloroform in quantity to make a fluid of honey-like consistence. When spread, it will dry in a few minutes. Heat the surfaces at a fire or gas flame until softened, and apply them together. Small patches of leather can thus be cemented on boots, etc., so as to almost defy detection. It is waterproof, and will answer almost anywhere unless exposed to heat, which will soften it.—Your other questions should be answered by some physician.

(54) H. M. R. asks how to remove ink stains from linen. A. Wet the finger in water, then dip into a powder consisting of one part of finely powdered oxalic acid mixed with four parts of cream tartar, and rub it on the spot gently, keeping it rather moist, and the stain will disappear without injuring the fabric. After the stain disappears, wash the linen in pure water.

(55) G. B. B.—A fireproof whitewash can be readily made by adding one part silicate of soda (or potash) to every five parts of whitewash. The addition of a solution of alum to whitewash is recommended as a means to prevent the rubbing off of the wash. A coating of a good glue size made by dissolving half a pound of glue in a gallon of water is employed when the wall is to be papered.

(56) W. J. D. asks how to make a small portable "filter," to be used on a faucet for filtering hydrant water. A. The essential feature of the ordinary portable filters is a layer or stratum of sand and coarsely powdered charcoal; the water, however, first passes through a sponge, in order to remove the coarser portion of the impurities. This is inclosed in a brass tube fitting by means of a thread on to the faucet, and also its capable of being opened at the center, so that from time to time the filtering substances can be renewed.

(57) W. H. C.—A red ink for marking clothes, which is not attacked by soap alkalies or acids, can be prepared as follows: Enough finely pulverized cinnabar to form a moderately thick liquid is very intimately mixed with egg albumen previously diluted with an equal bulk of water, and beaten to a froth and filtered through fine linen. Marks are formed on cloth with this liquid by means of a quill, and are fixed after they have become dry by pressing the cloth on the other side with a hot iron.

(58) F. G. T.—It is wrong to paint the drums of meters; they should be of good enough material to stand without it unless the gas is very bad. As for the cases, if they are heavily tinned they should not need painting. If, however, you desire a coating, the ordinary asphalt varnish will be found quite serviceable, or perhaps better still a mixture of red lead with linseed oil will be found to answer your wants.

(59) J. G. H.—The so-called jeweler's chamois to which you refer are also obtained from abroad, and as far as we have been able to ascertain, no one has ever been successful in impregnating the skin with the polishing powder in this country. It is presumed that this operation is accomplished at some intermediate stage during the process of preparing the skin for the market, and cannot be done after the skin is prepared.

(60) W. B. S. asks for information in regard to dissolving platinum. A. Dissolve the platinum in a boiling solution of aqua regia; this reagent consists of 1 part nitric and 2 of hydrochloric acid by measure. The operation must be continued until no nitric acid remains, thereby forming the platinum chloride. The fumes from this operation are very offensive and corrosive, so it may be found more satisfactory to purchase the platinum chloride rather than to attempt to make it.

(61) E. F. S. asks: Has a rate of speed equal to 90 miles an hour, ever been attained by railroad locomotive? Do the Grant Locomotive Works make such an engine? A. It is extremely doubtful if any locomotive ever made so high a speed. A mile in 48 seconds is the shortest time we have heard of. A rate of 70 to 75 miles per hour has been made on a spur, on good straight track. The Grant Locomotive Works could make such an engine. A. Is not 60 miles an hour considered remarkable time for trains on railroads to make, or is it something that is done frequently and by ordinary engines? A. 60 miles an hour for a train is considered a very high rate of speed, and is seldom attained in practice for more than a short run.

(62) E. G. writes: I desire to operate an electromagnet under water; what effect will the water have on the magnetic power? A. None, provided the coils are insulated. 2. What is the best way to insulate the magnet from the surrounding water? A. A coating of paraffine or shellac will do it. 3. What is the best way to make a magnet lever so as to prevent rust in the journals, being operated under water? A. Make it of brass; or bronze, nickel, or copper the exposed iron parts.

(63) P. J. O'M.—Boilers should be tested when new at twice the pressure they are intended to be used. A majority of stationary boilers in New York are tested at 150 pounds. The New York sanitary test is about 50 per cent higher than the certificate of pressure allowed. Cold water pressure is usual. You may obtain a pump from \$10 to \$30. Any pump that will make the pressure will do, and there is a great variety of makes.

(64) W. B. asks: 1. Will a two inch pipe with one inch faucet give more water than a one inch pipe with one inch faucet, both pipes leading from the bottom of the same tank, leaving friction out of consideration? A. The friction cannot be left out of the question. The 2 inch pipe will give the greatest flow. 2. Why do miners begin with a large inlet in hydraulic mining? A. Taper nozzles are found to give the best results, or quickest flow for a given head.

(65) C. T. writes: I want to make a wire solder to be applied without a soldering iron. Can you give me the preparation of lead and tin and the method of preparing it? Does it require any acid or rosin mixed with it? I saw it sold on the street in New York seven years ago. A. Mix 2 parts tin, 1 part lead by melting. Stir well together and pour slowly into a little sheet iron pan with small holes perforated along the bottom edge, at the same time draw the pan along a plate of iron or a smooth stone. The solder will run through the holes, forming little parallel strips. A little practice will make you perfect.

(66) A. S. asks how to make melted brass stick to wrought iron. Should the iron be hot, and how is it best to proceed? A. The iron should be at a full red heat. It should be clean, and covered with borax. The brass should be poured very hot, and in quantity so as to run over, that the surface of the iron may be brought up to the brazing temperature.

(67) A. V. W. asks why it is that on the ceiling of a lath and plastered room one can see every joist and lath, the space where the joist and lath are being alike. A. Plastered ceilings are porous, allowing air to circulate through them. The air carries dust and smoke with it, which lodge on the surface, the ceiling acting as a filter. Where beams and lath back the plaster, the circulation is impeded or entirely stopped, which prevents the lodgment of smoke and dust.

(68) J. T. R. asks whether one could detect any free oxygen in a jar of nitrogen by means of a lighted candle. A. If the quantity of oxygen was slight, we do not think it could be detected. The fact that nitrogen does not support combustion would sustain the probability of oxygen being present in the mixture if a candle burned in the jar. We should suggest the use of pyrogallic acid as being a more satisfactory test. This compound absorbs oxygen very readily, turning black.

(69) A. N. D. asks for a receipt for a cement which will stick sheepskin firmly to white or sheet iron, and which will stand an occasional wetting. A. Spread over the metal a thin hot solution of good glue; soak the leather with a warm solution of gall nuts before placing on the metal, and leave to dry under pressure. If fastened in this manner, it is impossible to separate the leather from the metal without tearing it. See also receipts given in SCIENTIFIC AMERICAN SUPPLEMENT, No. 158.

(70) M. C. asks: 1. How is the silver currency of the United States made? A. See article entitled "United States Mint, Philadelphia, Pa.," in SCIENTIFIC AMERICAN SUPPLEMENT, No. 117. 2. I have had occasion to use quicksilver and white of egg on furniture. Would it be safe to use hot soap suds therewith. Some say the quicksilver coming in contact with the hot water would salivate the person working with it, or any one in the room. A. We fail to see any reason why hot soap suds should not be used. The action of hot water on mercury would be so slight that probably no injurious effects would follow. Quicksilver itself is not poisonous, except in state of vapor or when finely divided. The salts, however, are injurious. If carefully handled, no danger should follow the use of hot water on mercury.

(71) D. asks for a prepared chalk that could be used to mark patterns, before sending to foundry, that would not be rubbed off in handling, but that could be erased when desired. A. French chalk or colored chalks might be used. Ordinary colored pencils would make a mark quite permanent, and yet one which could easily be removed. The artists' pencils could likewise be used.

(72) J. A. L.—Coil springs have been made of considerable power, say up to one or two horse, but it has been very expensive to make such springs, and it requires more power to wind them up than can be got from them. They are used to a limited extent for sewing machines and some other light machinery, mechanical toys, and clocks. The practical working of large springs has not as yet been a success, and they are liable to breakage, but for small powers are frequently available. Our advertising columns give names of manufacturers.

(73) J. D. A. desires a recipe for making printers' inks—black and red. A. For black ink: Take of balsam of copaiba (pure) 9 ounces, lamp black 3 ounces, indigo and Prussian blue of each half an ounce, Indian red ¼ ounce, yellow soap (dry) 3 ounces; grind the mixture to an impalpable smoothness by means of a stone and muller. Canada balsam may be substituted for balsam of copaiba where the smell of the latter is objectionable, but the ink then dries very quickly. The red inks are similarly made by using such pigments as carmine, lakes, vermilion, chrome yellow, red lead, orange red, Indian red, and Venetian red.

(74) F. A. asks how the insides of telescopes, microscopes, and laryngoscopes are blackened. A. Lampblack mixed with turpentine answers well for this purpose. Lampblack mixed with alcohol having a very slight trace of shellac in it also answers very well indeed.

(75) A. H. asks: 1. What will produce a high polish on bleached cotton cloth? Must be colorless and applied with a brush, must wash off with ordinary soap and water, must be cheap. A. Try cold starch with one-quarter its weight of isinglass. Dissolve the isinglass in warm water, and stir in the starch. 2. What is the most nourishing steam bath that can be applied to a person who is unable to sweat, and can take but little food in the stomach? A. Produce the sweating by burning alcohol under a chair in which the person sits, with blanket covering to hold the heat. Use caution and but little alcohol. Fire it in a shallow iron pan or old saucer. 3. Where can I procure a steam boiler that will stand from 10 to 25 pounds pressure, the dimensions are say 2 feet in diameter by 3 feet high, with firebox under it, and at about what cost? A. From any boilermaker in cities nearest. Cost about \$125. 4. Supposing I have a deed, the original writing on the body of which is claimed to have been eliminated and rewritten, while the acknowledgment of same at the bottom of deed is claimed as the original acknowledgment. By what means can I detect this either chemi-

cally or with microscope? The ink used being an aniline or ordinary ink, such as is put on the market. A. You should consult an expert, who can only advise after examination of the document in question.

(76) B. W. D. asks for a receipt for coloring meerschaum pipes without smoking. A. The meerschaum is steeped or heated in linseed oil which has been suitably colored by means of dragon's blood and gamboge; or else the same effect may be produced by boiling in wax to which dragon's blood has been added as coloring material. The meerschaum to be treated must be dry and free from any previous application of oil or wax. The manipulation is one requiring skill and experience.

(77) J. P. K.—For the manufacture of vinegar, the essentials are the oxidation of liquids containing alcohol by exposing such solutions to the action of the air at a temperature between 75° and 85° Fah. The details of the process depend upon the quantity you desire to make. Some expose the liquor in vats, others in barrels. The manufacture of vinegar by means of bacteria is described in SCIENTIFIC AMERICAN SUPPLEMENT, No. 247, to which we refer you.

(78) T. B. J. asks the proportions of oleic acid, glycerine, and water necessary to produce the bubbles alluded to in No. 2, vol. III. A. Dissolve Castile soap in strong alcohol, let it settle or filter, and take the clear solution, from which evaporate the alcohol. The solid residue is oleate of soda. To this add half its weight of glycerine and sufficient water to give the proper consistency. Another method consists in shaking fine shavings of palm oil soap in a large bottle with distilled water, until a concentrated solution of the soap is obtained; this is filtered through gray filtering paper, and then mixed with about one-third its weight of pure glycerine. The fluid is to be well shaken before using.

(79) J. W. P. writes: Can you give me a receipt for a cement or glue that will hold emery on a felt wheel for polishing iron or castings? Common glue will not hold, as the heat caused by the friction warms the glue and loosens the emery so that it rubs off. A. The felt wheel is first filled with oil, then the emery powder is poured on, and mixing with the oil forms the polishing material. No glue is to be used.

(80) J. M. G. asks (1) how a crust of whitewash can be removed from the ceilings of rooms? A. Whitewash can readily be removed by scraping the ceiling or else by washing it off with water. 2. What system of shorthand would you advise a young man to learn? A. Either Graham's or Munson's system is good. Both are extensively used.

(81) G. C. H. writes: I have a vat 12 feet wide and 10 feet high, holding about 7,000 gallons, which I use for storing vinegar in. It is constructed of American pitch pine (new wood). When the vinegar has stood in it a short while, it acquires an unpleasant smell and taste from the resin or turpentine of the timber. I have tried to cure this by coating the inside with paraffine, but I have not succeeded. What can I do to effectually overcome the evil? A. Your tank should have been constructed of white pine or else of white oak—the latter is the better; then lined with paraffine. If the latter be thickly applied, we fail to understand how any odor can penetrate it. Before the process of paraffining became prevalent, a thick coat of whitewash used to be employed, and sometimes shellac was used to form the lining of the tank, but paraffine has at present replaced these substances.

(82) R. G. H.—Ordinary powdered glass is used with the varnish. A Bunsen burner is one which burns with a non-luminous flame, in consequence of the introduction of a current of air near the base of the burner. They may be readily obtained from any dealer in chemists' or druggists' outfits.

(83) J. D. W. asks: Which is the most durable, iron or brass, for thin wire stretched on a fence and exposed to the sun and weather? A. Both wires being naked, and with no tension, the brass wire would last longest. With tension the iron wire will not break, while the brass wire becomes brittle, and soon breaks. Galvanized iron wire is the best.

(84) M. asks how to make a steam whistle at small cost that will act with amount of pressure used to run a fair sized toy engine. A. Make or buy a toy whistle of tin of the same pattern as the boys make of willow twigs, and solder a small pipe to the mouth.

MINERALS, ETC.—Specimens have been received from the following correspondents, and examined with the results stated.

A. & H.—The sample appears to be a limestone rock containing small shiny particles of mica. An assay to determine the pressure of either gold or silver would cost \$5.—J. B.—The specimen is clay and of no probable value in New York city on account of the nearness of the deposits in New Jersey.—C. S. C.—The button is composed essentially of silver; it contains some copper, and probably iron.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted, March 31, 1885,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

Adding machine, M. Bouchet..... 314,561
Air and steam brakes, alarm coupling for, C. R. Van Ruyven..... 314,758
Alcohol, purifying, Bang & Ruffin..... 314,910
Amalgamating ores, F. Hollick..... 314,578
Animal trap, E. P. Peacock..... 314,602
Ax bit blanks, die for making, C. W. Hubbard..... 314,674
Ax poll clips, die for forming, J. U. Hubbard..... 314,845
Axes, hatchets, etc., machine for making, L. B. Hunt..... 314,842
Axle, wagon, A. E. Snell..... 314,981
Back band loop, J. P. Hamilton..... 314,829
Bag. See Feed bag.

Bag holder, W. B. Emmons..... 314,571
Bag holder, W. Yerdon..... 314,770
Bag or satchel, C. W. Jenks..... 314,628
Bag or satchel handle, W. Romer..... 314,724
Bale tie, J. A. Tippit..... 314,753
Barrel making machine, Freidel & Clough..... 314,926
Barrel, transportation, R. H. Kachline..... 314,681
Bath tub, folding, J. A. Throckmorton..... 314,752
Battery. See Electric battery. Secondary battery.
Bearing boxes, machine for applying Babbitt metal linings to, N. Shaw..... 314,614
Bearing for machinery, step, H. G. Hubert..... 314,676
Bed sofa, W. Reddell..... 314,608
Bed, sofa, F. Ringemann..... 314,879
Beehive, N. C. Mitchell..... 314,972
Bee keeping, N. C. Mitchell..... 314,973
Belting, machine for the manufacture of, M. Gandy..... 314,824
Bicycle, H. H. Jones..... 314,849
Bicycle saddle, W. D. McCoy..... 314,701
Blackboard, H. E. Moon..... 314,600
Blast holes, tamping, J. L. L. Knox..... 314,585
Blasting powder, A. Gacon..... 314,824
Block. See Horseshoe block.
Blower, J. F. Winchell..... 314,901
Bolster plate, R. Sergeant..... 314,730
Boneblack oven, G. Murdoch..... 314,866
Book, duplicating counter check, Gebhard & Barlow..... 314,662
Bottle stopper, C. L. Morehouse..... 314,708
Box. See Show box.
Box fastener, E. Andrews..... 314,641
Brake. See Car brake.
Brake lever, G. M. Huffman..... 314,579
Brick and packing for furnaces and for other purposes, fire, J. F. Clinchard..... 314,802
Bridge, suspension, S. T. Wilson..... 314,500
Bridle, J. R. M. Crawford..... 314,977
Brush cutting machine for vineyards, O. R. Rufus..... 314,979
Buckle, J. E. Lee..... 314,693
Buckle, trace, L. Carr..... 314,584
Burner. See Gas burner. Oil burner.
Burring machines, toothed cylinder for, C. L. Goddard..... 314,664
Bustle, C. R. Davis..... 314,566
Button, S. C. Scott..... 314,612
Button, T. I. Smith..... 314,616
Button, collar, H. J. Geer..... 314,826
Button fastener, E. Kempshall..... 314,684
Button, separable, H. A. Cables..... 314,795
Button, sleeve, S. C. Scott..... 314,613
Buttons, machine for the manufacture of, pearl, E. May..... 314,596
Callipers and dividers, O. Stoddard..... 314,625
Can, E. C. Hazard..... 314,899
Car brake, automatic, Turner & Beard..... 314,983
Car brake, electro-magnetic, H. S. Park..... 314,709
Car, coal, D. S. Dockstader..... 314,656
Car coupling, R. Hitchcock..... 314,577
Car wheel guard, railway, J. Jacobs..... 314,580
Car wheels, apparatus for removing and replacing, J. H. Vreeland..... 314,895
Carpet fastener, F. C. Hellmuth..... 314,671
Carpet rag looper, H. A. Morrow..... 314,704
Carriage top, E. E. Witham..... 314,903
Carriage top support, I. L. Umstead..... 314,631
Carrier. See Cash and parcel carrier. Egg carrier.
Cartridge shell extractor, C. M. Burton..... 314,563
Carts, conveyer for coal, T. A. Naylor..... 314,869
Cash and parcel carrier, Badger & Lakin..... 314,558
Caster, S. C. Mendenhall..... 314,948 to 314,968
Caster, F. K. Way..... 314,764
Caster, furniture, F. W. Jackson..... 314,647
Casting mould, type, R. Gnichwitz..... 314,827
Catch, safety, E. H. Johnson..... 314,582
Cell tray, W. A. Moore..... 314,864
Churn, A. H. Allison..... 314,772
Churn, G. S. D. Camp..... 314,796
Churn, P. A. Carter..... 314,797
Churn and butter mould, combined, A. Clarembaux..... 314,800
Churn power, C. W. Patton..... 314,875
Clasp. See Shoe clasp.
Clip. See Paper clip.
Cloak, lady's circular, L. Graner..... 314,665
Clock, secondary electric, W. F. Weisgerber..... 314,634
Coasting device, roller, Stoddard & Terwilliger..... 314,626
Coat collar and hood, combined, O. Flaig..... 314,444 to 314,448
Cock for wash basins, J. Jungbluth..... 314,943
Cock, gas, D. M. Parker..... 314,874
Collar mould, horse, T. F. Lemassena..... 314,589
Coloring matter from beta-naphthol, M. Hoffmann..... 314,938
Coloring matter from gamma disulphonic acid of beta-naphthol, red, M. Hoffmann..... 314,939
Compound jack, L. Becker..... 314,560
Corn drill, M. Porter..... 314,604
Cotton gin, W. L. Crowson..... 314,917
Coupling. See Car coupling. Hose coupling. Thill coupling.
Cranes and other hoisting apparatus, transmitting power to, H. Young..... 314,906
Cranes, swinging, H. G. Hubert..... 314,675
Cultivator, E. E. Whipple..... 314,787
Cultivator and weed cutter, S. E. A. Palmer..... 314,873
Cup. See Lubricating oil cup.
Disinfectant, R. A. Fisher..... 314,820
Disinfecting apparatus for water closets, A. M. Loryea..... 314,590
Distillates, apparatus for separating and distributing, G. H. Perkins..... 314,715
Ditching machine, A. Long..... 314,859
Drier. See Paper board drier.
Drill. See Corn drill. Rock drill.
Drill core catch or retainer, diamond, A. Ball..... 314,777
Dry closet, etc., I. D. Smead..... 314,884
Drying machine, continuous-acting centrifugal, E. C. Roettger..... 314,880
Dyes, steam box for fixing, W. Thomas..... 314,629
Egg carrier, J. L. Joyce..... 314,942
Elastic woven fabric, W. E. Jefferson..... 314,581
Electric battery, I. I. Roberts..... 314,722
Electric lights, suspending, W. H. O'Beirne..... 314,976
Electric wire conduit, D. Brooks, Jr..... 314,791
Electric wire conduit, J. S. Du Bois..... 314,568
Electrical indicator, F. J. Sprague..... 314,829
Electrical wire conduit, M. H. Devey..... 314,655
Elevator. See Hay elevator.
Elevator, U. P. Smith..... 314,736
Elevator safety appliance, G. H. Reynolds..... 314,721
Elevators, etc., valve for hydraulic, G. H. Reynolds..... 314,720
Elliptic spring, W. Davison..... 314,919
Engine. See Hydraulic engine. Oscillating engine. Traction engine.
Erasing compound, ink, C. Walpuski..... 314,759
Extensible stand, C. Denecke..... 314,608
Extractor. See Cartridge shell extractor. Stump extractor.

