RECENTLY PATENTED INVENTIONS.

Railway Appliances.

CAR COUPLING. — Henry W. Hoss, Gamma, Mo. This device is automatic in coupling, and does not require the brakeman to step between the cars in coupling or uncoupling, while it is designed to be very simple and durable in construction. Spring-pressed plates are mounted to slide opposite each other in the drawhead, and a coupling link having an arrow-shaped head on each end is adapted to pass between the plates to press them apart and finally engage with the back of the head the inner ends of the plates, which are pressed toward each other by the springs.

CAR COUPLING. — Patrick Lee, Boise City, Idaho. This device is adapted for use with cars of the same or different heights, and is arranged for coupling from either side or the top of the cars, without the need of the trainmen going between the cars. The invention consists of a link pivoted at one end in the drawhead and a pin fitted to slide in the drawhead and adapted to be pressed on by the opposite drawhead of the car to be coupled, the pin being adapted to engage the link to swing it into position to couple the other drawhead. The construction is simple and durable, and a car provided with the improvement may be readily coupled with one having the ordinary link and pin coupling.

Engineering.

LINK MOTION. — John Lunz, Claflin, Kansas. This invention relates to valve gear mechanism for engines, providing a valve motion designed to relieve the reverse rod from all strain while the engine is at work, and throw the entire motion direct on the valve pin. The outer ends of the eccentric rods have hooked members, which are pivotally joined to the upper and lower end of a slotted reversing frame, the slots being of greater width at their ends but contracted at the middle to a width just enough to accommodate the valve pin. The motion is direct through the respective rods on the valve pin, and the plates of the reversing frame have a free movement without frictional contact with the valve pin.

Mechanical Appliances.

AXLE ROLLING MACHINE.—James S. Patten, Baltimore, Md. This invention provides a machine of simple construction designed to roll both the spindle or arm and the body portion of the axle section. Within a suitable framing is a pair of main rolls having around their circumference grooves or cavities adapted to form the body of the axle, while end rolls with grooves or cavities are adapted to form the axle spindle, the grooves being formed to open out at the end of the end rolls. The number of rolls may be increased at will and the form of the cavities varied to roll any desired form of spindle or axle body, while a simple, easily operated and effective feed for the axles is provided.

YARN NIPPERS. — Louis Wimmer, Elizabethport, N. J. This invention relates to the nippers or nipper heads of yarn or twine spinning machines, and consists in a nipper die provided with a movable wear block having several wear faces that may be successively brought into the path of the sliver to receive wear as the preceding one becomes worn. With this construction, when one surface will no longer exert the proper tension on the sliver, the wear block is merely given a slight turn to bring the next succeeding wear surface in line with the passage through the head.

SPINNING MACHINE YARN NIPPER.—This is another invention of the same inventor for a device from which knots or obstructions of the fiber may be easily removed without dismembering the parts, and which will produce tightly twisted, smoothly finished yarns or twines, of any desired size or gauge, with economy of time and labor. The bed die of the nipper has a groove or channel receiving the yarn and provided with a medial cavity and a transverse opening, while a yielding die has a convexed face, between which and the concavity of the bed die the sliver passes at the transverse opening while being twisted.

MILLSTONE DRESSING MACHINE. — George A. Smith, Cohoke, Va. This machine is designed to quickly cut furrows and facing on stones, and consists in a main frame carrying a socket secured to the drive spindle to turn a stem or spindle carrying a drive gear, while a circumferentially and radially movable cutter frame is arranged to carry a vertically reciprocating cutter or chisel, there being a jointed connection between the cutter frame and the main frame, and belt and gear connections between the cutter-operating devices and the gear on the socket spindle. The cutter-carrying frame is automatically fed radially toward the eye of the stone when the machine is used for cutting furrows.

Mining, Etc.

ORE CONCENTRATOR. — Edward W. Clark, Butte City, Montana. In a suitable framework a central vertical drive shaft carries two circular tables, one above the other, the tables having concentric steps thereon, while a series of water pipes is arranged to deliver upon them. The ground ore or pulp is delivered centrally on the upper table, and as it is washed the heavier portion is left on each step. As the table revolves, the concentrates are rewashed, until removed by outward pointing jets and a scraper, the tailings being washed on the lower tabie.

ORE SAMPLING DEVICE. — Robert C. Hawley, Pueblo, Col. This invention consists of a hopper, and dividing wings arranged under it to divide the ore passing down into halves. The hoppers also may be arranged one above the other, and dividing oscillating wings arranged alternately with the hoppers, so that the wing below a certain hopper divides the ore from that hopper into halves, of which one-half is guided by the wing into the hopper next below. The construction is simple and durable, and the device is designed to give an accurate sample of any quantity of ore passed through it, whether fine or coarse, the sample being cut down to the size desired.

Agricultural.

HAY RAKE.—John H. Soehren, Everly, Iowa. This is a simple and effective implement whereby the hay may be placed in a windrow at the right or left of the implement, or may be carried straight ahead. When it is desired to dump the hay, or free the rake head from engagement with it, this is accomplished by means of a lever within easy reach of the driver, whereby the teeth may be elevated from the ground, the hay being left in such position as greatly to facilitate the work of the loader following the rake.

Miscellaneous.

REFRIGERATOR AND GAS GENERATOR.—Harry B. Cornish, Hampton, Iowa. This is a combination apparatus for the cooling of refrigerators, cars, and cold storage compartments, and which may also be employed to furnish gas to a burner or gasometer for lighting purposes. The refrigeration is effected by the use of gasoline or other volatile fluid, in conjunction with compressed air and an atomizer, the gas generated by the air and fluid forced through the atomizer being sprayed into coils of pipe in the compartment to be cooled, and all the fluid not generated into gas finding its way back to the fluid receptacle.

DIVING SUIT. — Joseph L. Boucher, Emery H. Brault, and Romuald Filteau, West Superior, Wis. This invention provides an armor to be worn under a rubber suit, to give greater air space and prevent the pressure of the water from interfering with the comfort and use of the limbs and body, thus enabling the diver to work at a greatly increased depth. The armor has its body portion made in two hinged halves working about a vertical axis, and has longitudinal articulated limb braces to which are attached circular rings or ribs, the body section having an adjustable slide for increasing or diminishing the size of the arm holes, while the crotch and the body section have an articulated connection with a vertical adjustment.

BOTTLE WASHING MACHINE. — Otto Eick, Philadelphia, Pa. This is a simple and durable machine adapted to simultaneously wash a large number of bottles, which are not handled by the operator. Connected with the water supply are revoluble pipes, each having a cleaning device at its discharge end, the nozzles passing through a sliding frame on top of which is held a crate supporting the bottles so that the nozzles pass into them. Each set of bottles may be subjected to one or several scrapings by the movement of the frame.

CIGAR BUNCHING MACHINE.—Thomas and Lee B. Hancock, Richmond, Va. This machine is designed to quickly and evenly wrap the binder around the tobacco fillings, the binder being wrapped as smoothly at the point as at the butt end of the bunch. The rolling apron is constructed, in connection with traveler slides, to act as formers, so that after the binder has been placed upon the fillings the cigar body will have its proper shape ready for the outside wrapper. The machine is designed to be made at a small cost and easily operated.

CHECK BOOK.—George L. Winn, Jersey City, N. J. In this book the checks are printed consecutively on the same side of a single sheet, which is so folded that only a portion of the checks or the entire number may be rendered quickly visible, the checks being removed singly or connected in sheet form. The stubs are also contiuously connected, and having a continuous column for records, thus dispensing with the carrying over of balances from page to page, and enabling one to readily detect and rectify mistakes.

MAIL WAGON.—Robert R. Richardson, Portland, Oregon. The body of this wagon has a fixed vertical flange extending around its sides and front, and a revoluble turret is mounted on the body within the flange and provided with a series of compartments. The turret is held in fixed position by a ratchet mechanism, and may be revolved by means of a lever. It has compartments having openings through the outer walls, and other compartments with pigeon holes and swinging doors, adapted respectively for newspapers and letters, the wagon being designed for carrying assorted mail or distributing light articles, and so constructed that the various compartments may readily be brought within easy reach.

SASH FASTENER. — Joseph De Mars, Albuquerque, New Mexico. This is a device for locking both the upper and lower sashes, and consists of a casing supporting two bolts arranged at right angles to each other, there being independent springs for operating the bolts in one direction, one of the bolts being movable longitudinally, and the other longitudinally and rotarily, while it has a crank-like arm to engage the bearing of the first bolt. The construction is such that the lower sash may be locked closed or at any desired height, and the lower sash may be locked to the upper sash, so that the two sashes may be held in any suitable position or entirely closed.

COOKING APPARATUS. — Paul L. Dermigny, New York City. This is a foldable apparatus designed for tourists, etc., and forming also a convenient storage receptacle for articles previous to cooking. It has a base forming a fuel receptacle, and to which is hinged legs supporting two concave dishes held together at their edges and forming a shallow air tight vessel, the upper dish being adapted for use as a plate or saucer. Suitable keepers are provided for retaining a knife and fork, and a separate dish is provided for alcohol to be used in cooking if desired.

SCISSORS.—William H. Sample, Albany, N. Y. In these scissors a swinging latch is pivoted to one blade and provided with a notch in one side edge to receive a portion of the pivot, which is reduced adjacent to its head. The latch forms a permanent attachment of the scissors, and the invention is an improvement on that class of scissors in which the pivot has a notch engaged by a latch to hold the two blades together.

BUCKLE FASTENER. — Frederick A. Blackburn, Bisbee, Arizona Ter. This fastener is composed of two independent metal parts or slides, one part having a flat, band-like loop, with a projecting flat tongue having a pin on its face, while the other part has an upper or outer flat base piece forming an intermediate band-like loop provided with a pin beneath, small holes being punched in the strap for the pins. By this means the buckle may be fastened to a strap without sewing or riveting, the fastening being very durable.

GATE WORKER.—Silas Portis, Monrovia, Ind. This invention provides an apparatus for opening and closing a gate in a carriage way, as the wagon approaches and leaves the gateway, doing away with the necessity of a gate tender. The gate is connected by rods and chains with a lever pivoted on a post at the side of the roadway, a few yards distant, and this lever is connected with a crank in the path of the vehicle wheel, by means of which, as a vehicle approaches, the lever is operated to swing the gate open, a similar crank and lever connection operating to close the gate when the vehicle passes beyond it.

WIND TOY.—Johann R. Zuberbuhler, Greenville, S. C. This device contemplates the mounting of sail boats or similar bodies on arms pivoted at a common center, there being also retarders upon the arms. The whole forms a toy to be carried in the hand to afford amusement to children, or to be arranged for support as an ornament in a garden or lawn, where it may be employed to keep birds away from small fruit and seed beds, etc.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention and date of this paper.

Business and Personal.

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Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters, or no attention will be paid thereto. This is for our information and not for publication.
References to former articles or answers should give date of paper and page or number of question.
Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.
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Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(3682) C. P. M. writes: 1. In query (3494) page 251, you say that if a rifle ball be fired perpendicularly into the air, it will have a greatly lessened penetration on its return, while philosophies say the velocity is the same both ways. Then why would it not have the same penetration downward? A. We think what the "philosophies" say must be modified by the further statement that, to secure such results, the ball must be fired in a perfect vacuum. The air resistance certainly diminishes the height to which the ball rises, and retards its descent, so that its penetration must necessarily be greatly diminished by its excursion in the air. 2. Could the motor described in SUPPLEMENT, No. 641, be run with gravity batteries such as are used in depots? A. Gravity batteries are not adapted for running motors of the size given.

(3683) A. S. Q. says: Suppose a man to fall overboard from a vessel in midocean, water very deep; will he go to the bottom, or after having reached a certain depth, will the water be too dense to allow of his sinking further? A. There is every reason to believe that any body that will sink at all will sink to the bottom. The known fact that fishes live at the bottom of the deep seas, that water is but very slightly compressible, and that organic bodies are also equally or more compressible than water, sustains this view.

A substantiating fact is known that a wooden whaleboat has been carried down so deep in the ocean by a harpooned whale that when the whale rose to the surface and was captured, the boat had to be hauled up by the line, and was found to be so thoroughly water-logged and compressed by its few minutes' dive that the wood had become heavier than water. Fishes having live elastic tissue are compressed to the same extent, but recover in rising by their own exertion. It has also been stated that whales that have received a death shot and dived have not come to the surface, although watched for during several days.

(3684) L. N. writes for an effective exterminator for fleas, etc., on domestic animals, and for bed bugs and all other pests of the kind. A. A little of the essence of pennyroyal sprinkled about is said to be effectual in driving away fleas; Persian insect powder is also used for the same purpose, and we doubt if anything is more efficient than fresh Persian powder of good quality for the destruction of bed bugs and other pests of a similar character. Buhach or pyrethrum (see SUPPLEMENT, Nos. 247 and 299) is highly recommended.

(3685) F. M. S. asks: How many times will I have to carbonize my plater and rods, as described in "Experimental Science," for carbons to use in batteries? A. They will answer very well without recarbonization; but two or three repetitions of the process will improve them.

(3686) W. G. R.—We favor the Staten Island stone, which is a fine grained trap rock. It takes a fine finish.

(3687) W. H. L. asks: 1. Will a dental lamp of one-half candle power, requiring from 3 to 4 volts and 1·20 amperes, work successfully from a medical battery composed of two bichromate cells and an induction coil? And whether it should be attached to the primary or secondary wires? A. Two bichromate cells should easily run a one-half candle lamp. The lamp should be run directly from the batteries, the induction coil being disconnected. 2. What is the E. M. F. and amperage of the Roberts storage battery? A. The E. M. F. of all storage batteries with which we are acquainted is about two volts. As we do not know the constants of the battery referred to, we cannot state the amperage. 3. What is the principle of the governor of the speed in motor of Edison's phonograph? A. The governor of the Edison motor used in the phonograph is a centrifugal governor, which operates by shunting the current through resistance. 4. Can a rheostat of 16 candle power lamps be used successfully with current supplied by an Edison 120 volt incandescent circuit, to do electro-plating? If so, how must the lamps be arranged for silver, gold, copper and nickel plating? A. You may put a lamp in series with your bath. This will give you in the neighborhood of one-half ampere of current. The voltage of the bath terminals will depend on its resistance. For more current put more lamps in parallel, and carry one lead joint to one terminal of the bath, and a single lead from the other terminal to the other main wire. 5. What is the best kind of watch demagnetizer to use with my rheostat? What is the principle of it? And how could I make it? I have a commutator or alternator which is turned by a crank. A. A good way to demagnetize a watch is to attach it to a twisted string and twirl it in front of an electro-magnet, at the same time withdrawing it from the magnet as it rapidly revolves. See query 3275.

(3688) H. R. B. asks: What is the composition used in making rollers for printing presses? I have some pieces of copper tubing of the proper size and wish to make some rollers. How shall I proceed? How long should they be left in the moulds? How shall I get them out? A. Printers' rollers are made by soaking good white glue until it swells to a jelly, drain off all excess of water and mix with an equal portion of glycerine, heat with care so as not to scorch and evaporate the water until the proper consistency is obtained for the required work; which must be done by taking out a small portion, say a tablespoonful, and pour into the bottom of a small tin pan and set the pan in cold water to cool it to the proper temperature. This may require several trials. When the mass becomes of the right temper, pour into the mould, which should be very smooth inside and greased; with the spindle set exactly in the center. Let the mould stand for a day to get thoroughly cold and set, when the roll can be slowly pulled or pushed out by the gudgeon.

(3689) Mrs. Dr. B. asks how to remove iron rust from linen. A. If the ground be white, oxalic acid, employed in the form of a concentrated aqueous solution, will effectually remove fresh iron stains.

(3690) H. L. N. writes: The singeing of hair is at present greatly agitated by the professional tonsorial artist, claiming that through this process the hair will become more vigorous and prevent its falling out. This naturally would be a great benefit for persons with exceedingly thin hair, and especially for those who possess the misfortune of getting bald. Please inform me of your opinion on this subject. A. The remedy appears to be worse than the disease.

(3691) F. M. asks what the influence of a powerful current of electricity would be on the felting of furs? A. As fur is a non-conductor, we think a powerful current would have no effect on it. Possibly static electricity might be of some service. An experiment would determine this.

(3692) J. L. L. asks: Is there any cement that will fasten stereotype plates to wood bases? I have some plates difficult to nail, as the cut takes all the space. A. We cannot recommend any cement for the purpose. There are cements that would answer for a short time; but the wood is apt to swell and shrink under use, and this, together with the heavy pressure of the press, would be likely to loosen the plate and do injury to the type forms.

(3693) B. T. writes: I found mica float on the surface of the ground scattered for some distance in detached chunks, 10 by 14 inches in width and from 4 to 10 inch in thickness. The float is not transparent, but cloudy, etc. Does the mica lie in veins or deposits like other minerals? Please state what formation is mica found in. How would a person go about to discover where the float came from? A. No general rule can be given for prospecting for mica. The mineral mica is found in very irregular veins of what is often a coarse granite rock. It occurs in the primitive rocks, such as gneiss and granite. Only general Rules for prospecting can be given. In the Mineral Resources of the United States for 1887, published by the Department of the Interior, Washington, D. C., you will find an interesting and practical article on the subject of mica. We recommend also Anderson's "Prospector's Manual." $1.50 by mail.

(3694) C. H. M. says: 1. When matter of different specific gravity, but free to move independently in the same mass, is rapidly rotated, what will be relative position taken up by the heavier and lighter parts? Example: Suppose a hollow sphere, partially filled with oil and water in about equal parts, to be rapidly rotated on an axis, will the oil hug the equator and the water be in a ring inside of the oil, or the reverse? Or, what is somewhat equivalent, suppose the earth's rotary motion to be accelerated until all the water on the globe should be thrown out in a ring a thousand miles from the equator, would the earth's atmosphere be outside or inside of the water ring? A. Centrifugal force acts inversely as gravity. The heaviest element goes to the outer side in a centrifugal apparatus. The condition and disposition of the material of the earth would not come under this condition, because gravity must be the greater force, or the material would not hold together, but would fly off into space. Hence the heaviest or densest material would still gravitate to the center. 2. What is the explanation of a substance rubbed against itself producing more friction than if rubbed with equal force against a dissimilar substance? For illustration, two pieces of iron, or of wood, of the same kind, rubbed against each other with a force equal to x, will encounter more friction than if a section of the iron is rubbed with the x force against a piece of the wood. Is there a standard of equivalency established in respect to friction of different substances, bearing against each other in motion? A. In regard to friction of soft or hard substances, so much depends upon lubricants and the smooth and even surfaces that are moving over each other that no general explanation or theory will suit each case. Otherwise, the fact is apparent that soft substances moving upon each other with pressure do not adjust their surfaces of contact to a perfect plane, and are frictionally retarded according to its minute inequalities; whereas, with surfaces of unequal hardness, the tendency of the hardest surface is to assume a perfectly true surface by wear which is found to have the least friction. 3. What is the pitch of ordinary heavy rumbling thunder? How long would a closed organ pipe have to be to produce sound of the pitch of heavy thunder? A. The pitch of ordinary rolling thunder varies considerably, ranging through the median notes of the base clef, and would require a pipe from 8 to 12 feet long. 4. As forces act most readily in the direction of least resistance, does a sound (on account of the atmosphere diminishing in density as we go upward) act more effectively upward than horizontally? A. Sound vibrates more intensely upward than along the surface of the earth. This has been noticed by aeronauts, who hear ordinary sounds from the earth at great heights.

(3695) H. E. F. says: 1. A Corliss engine has just been erected which has a shaft fifteen inches in diameter and eighteen feet in length between bearings. The shaft and wheel weigh ninety-six tons, the former deflects 1/8 of an inch in the middle from excessive weight. With the wheel in motion will this condition change and the shaft resume a straight line? A. The shaft will not assume a straight line, nor approach near to it, unless the speed is so great that a half revolution is equal in time to the natural vibration of the shaft. As the speed of such engines is far below the requirement for synchronal action with the shaft vibration, you will not be able to discover an appreciable amount of relief from the spring of the shaft by its velocity. The shaft is too small. Would like to have more details of the engine. 2. I am running a compound condensing engine which requires four hundred gallons of water per minute. Could that water be passed through a motor or small wheel as it flows into the vacuum and produce a small amount of power? The source of supply is on a level with condenser. Vacuum 27-28 inches. A. A small motor could be run in the condenser water pipe, but it would be of doubtful utility. 3. We could utilize all of the exhaust steam from the engine above referred to in heating water for dyeing purposes. Under these conditions would it pay to run compound non-condensing? Or would it be better economy to use a surface condenser? Water from jet condenser not available for this purpose on account of oil. A. There would be just as much objection to the use of the exhaust for heating the dye tubs as there is to the use of the injection water. You would still have all of the oil in the tubs. 4. At eighty pounds pressure what should be the number of pounds of steam (in weight) consumed in heating sixty cubic feet of water from 50° to 212° Fah.? Also from 150° to 212°? A. It will require 525 pounds of steam to heat the water as stated from 50° to 212° and 207 pounds of steam to heat the amount from 150° to 212°.

(3696) S. R. T. says: Suppose a lead pipe 2 inches in diameter, laid from a spring, descends 19 feet into a ravine, then up 32 feet to the top of a ridge, thence down 70 feet to the base of a building three stories high. Can this pipe be made to siphon the water and raise it to the top of the building, 32 feet high? If so, what is the best way to fill the siphon. By a pump at the spring or an air pump at the house? What is the limit of useful employment of siphons this way? What is a good practical work on this class of subjects, and do you furnish it, and the price? I should have mentioned that the pipe will be a half mile long. A. The pipe can be made to siphon the water to the house, and should flow about 18 gallons per minute at top of house, if free from air. Place the air pump at the house for convenience. See SCIENTIFIC AMERICAN SUPPLEMENT, No. 793, on sipbons. The principle of siphonage is perfectly practicable wherever desirable within the limit of atmospheric pressure as applicable to pump suction, say 25 feet lift, and any height required in an invert siphon. In this way the siphon has been largely used in the United States for water supply. There are no books on this subject.

(3697) G. D. says: In running an inch pipe about 500 feet from a well upon a hill to supply a house and barn with water, to reach house under about 30 feet water pressure, and to be used for culinary and all house purposes, which kind of pipe is best—lead, ordinary wrought iron gas pipe, or the latter galvanized or tarred? Is the tar coating of the pipe durable? It would seem to avoid the rust of iron pipe, and the possible deleterious effects of the zinc salts from galvanized iron. Would the brass of ordinary globe valves cause salts to be formed, either from the brass or from other metals in contact with it, that would be injurious to health? A. Lead and galvanized iron pipe are the best for conveying water for household purposes. Both are perfectly safe if the water is kept running, or the contents of the pipe entirely drawn off after standing in the pipe overnight. The tarred pipe flavors the water for some time and the tar is not durable upon the inside of the pipe. Brass valves do not affect the water to any perceptible extent. The most approved management for a house and barn supply is to keep a small stream constantly running into a watering trough at the barn, with an overflow to an underground drain.

(3698) M. O. R. says: I am building nearly two miles of fence. Oak pickets ½×2 inches 4 feet long, woven in five pairs of wire, Washburn & Moen galvanizing process, in which the zinc is fairly soaked through the iron. Having some doubts as to durability of the oak pickets, I wish to apply some preservative which will not injure the wire, but preserve the wood. Would the Bordeaux mixture (sulphate of copper in a whitewash of lime) do? Is the copper salt injurious, or the lime, or both? Will you suggest something superior? A. There is no objection to the Bordeaux wash. Another way is to use 2 pounds sulphate of zinc and 1 pound salt to 30 pounds dry lime, and color if desired with yellow ocher, or any cheap mineral paint. To give the above a strong body a half pound of glue may be added, dissolved separately. You may also add a little glue to the Bordeaux mixture to advantage. If appearance is no object, coal tar is the best preservative. The whitewashes are not injurious to wood or wire.

(3699) M. C. S. asks: Will it be safe for one who has not had any experience to undertake to make a boiler to run a 2 horse power high pressure engine? What will be the easiest and safest type of a boiler to make? Have you issued any paper, explaining how to construct a small furnace that will be sufficient to melt iron? A. Many amateurs make small boilers and very good ones, but they require some shop privileges. If there is a good pipe fitter in your city, you may with his help make a safe and good boiler for any pressure up 100 pounds or more. You will find illustrations to scale and description of pipe boilers of one to threehorse power in SCIENTIFIC AMERICAN SUPPLEMENT, No. 702; you will find a portable furnace for melting 100 to 140 pounds of metal in SCIENTIFIC AMERICAN SUPPLEMENT, No. 180; and for a regular cupola consult West's "Foundry Practice," $2.50 mailed.

(3700) E. S. asks: What acid or solution can I use to rot or destroy stumps in ground after trees are cut down, mostly oak? How long will it take to rot them? A. There is no quick way of rotting stumps. The cheapest way to get rid of them, if you have no suitable means of pulling, is to bore a 1¼ inch auger hole down the center of the stump about 18 inches deep, and put in 1¼ ounces of saltpeter, fill the hole with water and plug it tight. In the spring take out the plug, pour into the hole a half pint of crude petroleum oil, and set it on fire. The stump will burn and and smoulder to the ends of the roots, leaving nothing but ashes.

(3701) H. W. W. says: How can the phylloxera be destroyed? A. Numberless remedies have been suggested and tried—sulphur, carbon bisulphide, coal tar, lime, soap, caustic soda and many others. The following are among the best receipts: See the SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 167, 205, 464, 471, 478. 1. Try sulpho-carbonate of potassium and sand. 2. London purple, a by-product in the manufacture of rosaniline, mixed with water. 3. Forty-five pounds sodium phosphate, 15 pounds ammonium phosphate, 60 pounds ammonium chloride, 45 pounds potassium sulphate, 75 pounds of soda, 2,800 pounds iron sulphate, 90 pounds flowers of sulphur. Mix with the soil. 4. Mix 45 parts nitrobenzol, 75 parts sulphuric acid, 1,400 parts water. To kill the eggs, make a paste of 4 ounces benzol, 8 pounds lime, and 360 pounds of earth.

(3702) R. J. F.—Window polishing paste is made of 99 parts prepared chalk and five parts each of white bole and Armenian bole, rubbed together into a smooth paste with 50 parts water and 25 parts alcohol. The paste is to be rubbed on the window, allowed to dry, and then rubbed off with cloths.

(3703) H. T. R. asks how to lag pulleys with paper. A. Scratch the face of the pulley with a rough file thoroughly, so that there are no bright or smooth places. Then swab the surface with a solution of nitric acid, 1 part; water, 4 parts; for fifteen minutes; then wash with boiling hot water. Having prepared a pot of the best tough glue that you can get, stir into the glue a half ounce of a strong solution tannic acid, oak bark, or gall nuts, as convenient to obtain, to a quart of thick glue, stir quickly while hot and apply to the paper or pulley as convenient, and draw the paper as tightly as possible to the pulley, overlapping as many folds as may be required. By a little management and moistening of the paper, it will bind very hard on the pulley when dry, and will not come off or get loose until it is worn out. Use strong hardware wrapping paper.

(3704) L. K. asks: What is the best way to prepare the canvas covering on a canoe to be used along the Florida coast? A. For a canvas canoe, rubber cement or varnish is the safest and easiest to apply. Use the kind obtained through the rubber trade and thin it with naphtha. After a painted coat of the thin rubber has dried, the thick paste rubber may be applied all over the outside with a spatula, and if carefully done will make a smooth waterproof b at. Paraffin wax melted in with a hot iron is excellent.

(3705) G. D. asks how to make a thick rubber cement. A. Rubber cement is made by dissolving masticated rubber in benzole or solvent naphtha. We refer you to "Rubber Hand Stamps and the Manipulation of Rubber." $1.00 by mail.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

November 24, 1891,

AND EACH BEARING THAT DATE.

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