RECENTLY PATENTED INVENTIONS.

Mechanical.

HAND PLANER. — Samuel M. Neely, Smith's Turn Out., S. C. This is a machine with a frame in which a carriage is adapted to travel, there being attached thereto saw or planer bits, the carriage being conveniently and expeditiously manipulated and the knives being adjustable to operate on boards of varied thickness.

DIE FOR MAKING ROCK DRILLS. — John Cahill, Tarrytown, N. Y. Combined with hinged die sections oppositely and longitudinally channeled to produce a circular aperture are four spaced guides, with die keys made to slide between them, and other novel features, whereby a steam hammer may be utilized to rapidly and perfectly form the wings and cutting edges on a rock drill.

Agricultural.

HARROW. — Niels L. Beck, Brayton, Iowa. The frame of this harrow is preferably made of iron or steel, broad at the rear and narrow in front, and having forwardly projecting teeth attached to the bars of the frame in such a manner that they will be held and firmly braced therein, while the construction is designed to be simple, durable and cheap.

PORTABLE CORN CRIB. — Charles I. Cook and Henry M. Britton, Odebolt, Iowa. The body of this crib is composed of vertical slats united by twisted wire bands, the body having a side door, and there being a detachable chain for connecting the edges of the body, the whole having a conical top and removable cover, making a cheap and strong crib to build where lumber is scarce.

RICE MACHINE. — Squire A. Pickett, Crowley, La. This machine consists of a drum or casing having its lower portion divided into compartments and its upper portion provided with partition plates with depending stop ribs, and a shaft having arms or beaters, the machine being adapted for both hulling and scouring rice.

Miscellaneous.

GATE. — William H. Clay, Paris, Ky. This invention relates to road or farm gates designed to open in either direction by a traveler on horseback or one sitting in a vehicle, the gate being operated by simply pulling on one end or the other of a rocking beam to release the gate from its latch and so that it will be tilted out of the perpendicular, swinging open by its own gravity, while it may be closed with equal facility.

INDICATOR FOR DUMB WAITERS.—Louis Friess, New York City. This is a device to be placed at the bottom of the shaft to automatically indicate the location of a dumb waiter or elevator at any point from the bottom to the top of the building, the invention covering various novel features of constructions and combinations of parts.

SPIRALLY CRIMPED HOOP.—Leonard L. Frost, Barada, Neb. This hoop is formed with a spiral groove which extends in an unbroken or in broken sections from end to end of the band from which the hoop is formed, the crimp preferably commencing above the vertical center of the band and ending below the center, the object being to prevent the displacement of the hoop in case of the shrinkage of the staves.

FIRE ESCAPE. — Adolph Boettcher, South Stillwater, Minn. Combined with a truck mounted on inclined ways, and carrying a drum, is a ladder arranged to pass over the drum, a reel to which the ladder extends, and other novel features, the apparatus being designed to facilitate escape from a burning building, while the parts are so arranged that they will be concealed when not in use.

PORTABLE CHUTE.—James Musgrave and Joseph P. Clarke, Buenos Ayres, Argentine Republic, S. A. The chute sections are combined with cables, and have transverse strips and hooked irons, the irons being arranged to engage the cables, making a readily movable and very flexible chute, which may be adjusted with facility to deliver the material with which a vessel is loaded to any one of the hatches.

PULP MACHINE.—Charles S. Bucklin, Keyport, N. J. This is a machine with curved and channeled ribs and fine and coarse sieves, to facilitate the reduction to pulp of tomatoes, pumpkins, and other vegetables, and also grapes, currants, berries, and other fruits, and separate the pulp from the seeds, skins, etc.

PORTABLE BLACKING STAND.—George W. Browne, Brooklyn, N. Y. This device has a folding casing, with a base having a back and hinged top and sides, wheels being secured to the rear face of the back, with other novel features, whereby the stand may be readily set up or closed and moved from place to place on the wheels.

RETAINING DEVICE FOR OVERSHOES. —John A. Patton, San Diego, Cal. This device consists of an S-shaped strip of spring metal, adapted to be readily applied to the top rear part of the overshoe, and afford means for convenient attachment thereto of a cord to be passed around over the instep, whereby the shoe will be prevented from being drawn from the foot by suction or otherwise.

CORNET.—John F. Stratton, Brooklyn, N. Y. This is a French or Pyrenet piston valve cornet, the mouth piece being of uniform diameter and leading to the first one of the valves, while an end pipe having a bell leads from the third of the valves, gradually increasing in size from the third valve, the improvement being designed to increase and beautify the tone.

VEHICLE SEAT TOP.—Henry McCurry, Chicago, Ill. This is a top which may be adjusted forward or backward to shield the driver from rain or sun, and in which the bows may be folded to not interfere with the loading of the vehicle, the invention covering various novel features of construction and combinations of parts.

LUMBER MEASURING DEVICE. — Thomas Newnham, Columbia, Fla. This is a machine for automatically measuring the contents of boards as they are passed through an edger or planing machine, and consists of a roll mounted to turn in a slotted box, with longitudinally extending graduations indicating board measure appearing through the slot in the box.

COMPOSITION FOR RAZOR STROPS.—Henry A. Parker, Shiloh, Tenn. This is a composition to be applied with a sponge or otherwise to cypress wood or other material of an absorbent character, the compound soaking in so that it will not need renewal, and being designed to put a very fine cutting edge upon a razor or other edged tool or piece of cutlery.

BREECH LOADING ORDNANCE. — Anthony Victorin, Troy, N. Y. This invention covers an independent removable annular breech plate, means for rotating the breech block and locking the crank handle, an improved rotatable translating roller for forcing in and withdrawing the breech block, automatic means for locking and releasing the pivoted latch that secures the swinging breech block, and an improved automatic cover or guard for the vent that prevents premature insertion of the primer, with other novel features.

PADLOCK. — William M. Brooke, New York City. This is a permutation lock so made that the shackles may be engaged and locked without adjusting the rings to form the combination, the means not being apparent to the ordinary observer, the lock consisting of flanged rings with registering notches in the flanges, and letters, figures or symbols on their periphery, the rings arranged to rotate about a vertical support, in connection with a shackle with double arms, one of which has locking teeth, and other novel features.

LAMP SHADE. — James P. Boesen, Hoboken, N. J. This is a translucent shade, made with a series of vertical single folds and a series of intersecting transverse double folds, giving the shade a conical shape, slightly curved inward in the direction of its lower edge, the shade being constructed of a single piece and designed to show upon its outer and inner faces an alternate dark and light tint.

GATE. — Philip O. Hirsch, Grand Island, Neb. This invention relates more particularly to what are known as "tilting gates," the gate being designed to be readily opened by a person approaching on horseback or in a vehicle, without dismounting, and conveniently closed after passing through.

SCIENTIFIC AMERICAN BUILDING EDITION.

MAY NUMBER.—(No. 55.)

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8. A cottage recently erected at Binghamton, N. Y., cost complete $3,800. Plans and perspective.
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Notes & Queries

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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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Minerals sent for examination should be distinctly marked or labeled.

(2172) T. H. B. asks (1) how to make an electric deposit of gold, silver, nickel, copper, etc., directly on a plaster of Paris cast. A. Coat the image with plumbago, brushed on with a hard brush; sprinkle with a little metallic iron in powder (iron reduced by hydrogen) before putting in bath, then plate by battery. 2. What is the most fusible metal at the lowest fusible point? A. Bismuth 50 parts, lead 25 parts, tin 12 parts, cadmium 13 parts. This is about the most fusible of alloys without mercury. 3. Will copper plate deposit on any metal? A. With enough battery it will on all the common metals. 4. Does the lowest fusible metal shrink in cooling? A. Yes; as it cools it contracts, though with enough bismuth it will tend to expand as it solidifies, contracting as it cools.

(2173) Mrs. W. E. asks: Can I, through the aid of your most valuable paper, find out whether cyclones, or such storms as visited our northwest during the last days of March, occur in Europe? And if not, why not? A. The regions of concentration of tornadoes and whirlwinds seem to be located in or near the meridians of greatest magnetic intensity, which may be drawn from the American magnetic pole through the Mississippi valley and Gulf of Mexico, and appearing on the opposite side of the globe from the Siberian pole through Thibet, Hindostan, and the Indian Ocean, the home of the simoons. The intermediate meridians of Europe and America, although not free from hurricanes, are less afflicted than regions on or near the meridians of magnetic intensity.

(2174) Tattoo asks: 1. What kind of ink is used in tattooing? A. India ink. 2. How can tattoo marks be removed? A. See SUPPLEMENT, No. 695.

(2175) G. W. C. asks how the noses of animals prepared for museums are kept from shriveling or puckering up while drying. A. For preventing shrinkage remove all glutinous matter by curing in a bath of 1 part salt, ½ part alum, in a barrel of water (salinometer 30°), soak and cleanse skin of all adherent fleshy matter. In the use of this prescription experimentation and caution are necessary.

(2176) R. B. asks for something which will be likely to prove effective in removing from a rather light-colored carpet the stain of red ink? The ink does not appear to be an aniline ink. A. Possibly alcohol with some oxgall may prove of use, but success in removing it is very doubtful.

(2177) W. W. J. writes: Can you tell me how long it will take a current of electricity of 50 volts to decompose a gallon of water? Is the water heated by the process? Can you tell where I can get information to perform the experiment? A. An electric current is not measurable in volts. See SCIENTIFIC AMERICAN, February 8, 1890, page 91. The water is not sensibly heated. The rapidity depends partly on the size of electrodes and connections, partly on the electromotive force. A difference of potential of two volts is sufficient. For illustrations and descriptions of apparatus, see the SCIENTIFIC AMERICAN, May 12, 1888, page 295.

(2178) F. M. N. writes: 1. Can you give me the formula for a good and durable violin varnish? A. The true Cremona varnish is of unknown formula; its preparation is a lost art. Varnishes in general are trade secrets. The following is a formula for an oil varnish:

Amber fused	2 oz.
Oil of turpentine	5 "
Drying linseed oil	5 "

The following is for a spirit varnish:

Mastic	1 dr.
Sandarac	1 "
Lac	6½ "
Alcohol	5 fl. oz.

To tinge with yellow, annatto, aloes, gamboge, or turmeric may be used; for red, dragon's blood or red sanders wood. By mixing the above, intermediate shades may be obtained. The formula is only half the art; much depends on the application, treatment between coats, etc. It should be done by an expert. 2. Can the pinhole be substituted for the ordinary lens photographing machine by removing the lens? A. Yes; but it needs an exposure of several minutes. 3. How can I make a piece of ground glass for a camera obscura? A. Rub with a cork, water, and sand, or better, grindstone grit from the trough under a grindstone. 4. Are the photographs taken on a pinhole camera of any value? Also please give names of chemicals for either pinhole or other cameras, their proportions and how to use them. A. Treat pinhole exposed plates as you would others. Many formulæ are given in our back numbers for developers, etc. 5. Is the lens used in a camera obscura a double convex or plano-convex? A. The lens varies according to its work, whether view, portrait, wide angle, etc. 6. Would like to have instructions as to how to make a good frictional electrical machine? A. Induction machines are now universally used. See our SUPPLEMENT, Nos. 278 and 584. 7. Would like to be informed if I could make concave and convex mirrors for reflection of light or heat. A. It depends on your mechanical ability. Consult SUPPLEMENTS 139 and 318, Lens Grinding. 8. Would like to have the formula for a good liquid glue, to be used on wood and the like. A. Mix good glue with water, heat until dissolved, and add half its volume of acetic acid. 9. What kind of wire would you advise for making a spiral spring for an air gun. It requires a good spring. A. Steel is the best, next comes spring-tempered brass.

(2179) J. L. S. writes: How can I remove stains of smoke and soot from granite? Of course I could do it by chiseling over the surface, but that would not be convenient. What acid or wash would answer the purpose? A. You may have much trouble in doing this. Try the following on a portion where the stain is bad. Mix ¼ pound of soft soap, ¼ pound whiting, 1 ounce of washing soda, and a piece of sulphate of copper as big as a walnut. Rub it over the surface and let it stand 24 hours, and then wash off. This and similar compounds are recommended for marble, and may effect a cure in your case. Thus a paste of 1 ounce ox gall, 1 gill of lye (caustic soda solution, strong), 1½ tablespoonfuls of turpentine, with enough pipe clay to make it of thick consistency, may be applied as above described.

(2180) T. H. writes: 1. Natural carbonic acid gas will settle in the bottom of a well and remain there unless forced out, being heavier than air. I have seen it stated also that it could be poured from one vessel to another, same as water, displacing the air. I filled a tin can with artificial gas, and it disappeared in 3 minutes. Is there a difference between artificial or manufactured gas and the natural? A. Both are identical, and neither will remain in an open vessel indefinitely. Artificial gas can be poured as described, but there is always a loss. 2. Fine furniture is made with wood as dry as it can possibly be made, yet in a room where natural gas is used as fuel it will still shrink. Can this be explained? A. What you see is due to deterioration of the glue rather than shrinkage of the wood. When glue becomes perfectly dry, it loses its strength. Glycerine might improve it in this regard.

(2181) J. S. F. asks: 1. Is there a patented device whereby the engine of a factory can be immediately stopped by electricity from any floor, in case of accident? A. Yes. 2. Would not the inhalation of pure oxygen mixed with air, or with nitrous oxide, be of probable benefit in chronic disorders of the nervous system, where a general condition of debility is the main trouble? A. Oxygen inhalation is now a part of regular medical practice. Nitrous oxide has anæsthetic properties that necessitate care in its application. It is used principally as an anæsthetic, but can be applied as a remedy.

(2182) W. E. A. asks: 1. What fraction of a horse power would be required to properly run a propeller six inches in diameter? A. One-eighth horse power. 2. What size should an aggregate of say eight electro-magnets be to attract with a force equal to one-fifth horse power, *i. e.*, what length and diameter the cores and number and length of wire? A. Magnets do not attract with horse power; the weight sustained varies with the current. 3. Can an ordinary bolt be softened sufficiently to be used in the construction of electro-magnets? If so, by what process? A. Yes. Heat to white heat and bury over night in forge cinders to a good depth. 4. How many hours will a chloride of silver battery last on a closed circuit, having about

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eight dwt. of chloride of silver? A. Not long; it depends on resistance of circuit. 5. About what part of a horse power is 25 volts and 4 amperes equal to? A. Nearly one-seventh.

(2183) Sydney asks: 1. If sirup for cordial be made with cold water, is it more likely to ferment than if it were boiled? A. Yes. 2. The best way to prepare charcoal for refining spirit, and whether any particular wood should be used. If the charcoal were merely placed in a cask of spirit, would it absorb the injurious matter and have the same effect as if it were filtered? A. Animal charcoal is most efficient. 3. The best mode for filtration of small quantities of spirits of about 30 gallons at a time. A. Use a percolator, and pack in the charcoal solidly. 4. The best publication on mode of preparation of American drinks, and price, including postage to Sydney? A. Jerry Thomas' "How to Mix Drinks, or the Bartender's Guide," 75 cents. 5. Has the aerating of wines been tried in America, and with what success, also the price of such aerating machine? A. Not to any extent with fine wines. Cider can be thus treated. 6. Best mode of preparation of raisin wine. A. We refer you to the SCIENTIFIC AMERICAN, December 8, 1888, page 356, for an article on the subject by U. S. Consul E. Johnson, Kehl, Germany.

(2184) H. C. K. asks: 1. What is the theory of the Tesla motor, and what is gained by the two independent circuits as shown in your SUPPLEMENT, No. 692? A. The two independent coils are connected in series. The whole is so proportioned that there is a constant difference of one-quarter phase between the two, owing to hysteresis or "magnetic lag." This causes the axis of north and south polarity to constantly vary, rotating always in the same direction. The armature induced itself keeps trying to "keep up," and hence rotates. 2. In SUPPLEMENT, No. 718 or 734, what is meant by the Carpentier bobbin (type 600 francs)? Is it an addition to, or is it the Ruhmkorff coil that is meant in the article "On M. H. Hertz' Experiments." A. The Ruhmkorff coil is indicated.

(2185) E. A. C. writes: I have noticed that many brass castings when taken from the sand are perfectly clean and of a uniform, almost golden color. How is this obtained? A. The golden-colored castings are made from clean metal, without iron: Copper 16 ounces, tin 1 ounce, zinc 1 ounce. The flasks should be opened quickly, in from 5 to 15 minutes after pouring, according to size of pieces, and the gate of work raised, sand rapped off, and plunged in water to check oxidation. A little practice will give proper manipulation. Should only have a quick dip, so that the heat of the castings will dry them. 2. Is there any constant battery of higher E. M. F. than the gravity battery? If so, what and how prepared? A. No practical battery. 3. Why will not the gravity battery run an induction coil? A. It can be so used.

(2186) V. R. asks: What causes the report and the recoil of a gun when a charge is fired? Are the recoil and report caused by air rushing into the barrel after the bullet has left the muzzle? Is there a vacuum formed in the barrel while the bullet is leaving it? Has the vacuum (if formed) anything to do with the report and recoil? A. The report is the vibration of the air, due to the instantaneous explosion. The recoil is the result of the sudden pressure generated within the gun pushing the gun in the opposite direction from that of the ball. There is no vacuum formed, but a large volume of gas is generated by the combustion of the powder, producing a great pressure upon gun and ball, sending them in opposite directions.

(2187) C. C. asks: Will a piece of timber ready to use in a mechanical way, ordinary dry timber, shrink endways? For instance: A piece of oak timber 6 inches by 6 inches square, 5 feet long, would the decrease in length be perceptible, and is it not an ordinary expression that timber does not shrink endways? A. Timber in drying has a very small shrinkage endwise. After it is seasoned, the permanent shrinkage becomes imperceptible, but changes in temperature, and the dry and wet seasons, may make slight variation in length. In architecture endwise shrinkage is not taken into account.

(2188) J. S. S. writes: In performing the experiment of putting an iron bar in the plane of dip and striking it a few blows with a hammer, I noticed this phenomenon, viz., both ends of the bar repelled the north and attracted the south poles of a compass. Why is this? Where were the consequent points? Must there not have been one of them missing in the chain? A. You have at least two consequent south poles in the middle portions of your bar. If you saw it in two, you may succeed in finding them.

(2189) W. B. J. asks: If the governing arrangement of an engine could be made so perfect that the least perceptible change in speed would regulate the supply of steam instantly from 0 to its full capacity, or just enough to insure an even and steady speed, could the flywheel of the engine be dispensed with? Is there a governor in use that regulates the engine in such a way that the same speed is maintained when working under a heavy or light load, provided there is steam enough to overcome the load? A. The automatic system of governing engines, as now in use, is probably as nearly perfect as the mechanical difficulties will allow. We see many difficulties in dispensing with the flywheel on a reciprocating engine, from the peculiar conditions of the application of pressure upon the piston. Uniform tangential pressure on the crank pin through its entire circle is one condition for dispensing with a flywheel.

(2190) B. H. S. asks: Can you give me a good receipt for waterproofing canvas, such as is used for canvas canoes? An elastic coating is preferable, so that the canvas may be folded. A. The best advice we can give is to have your canvas coated with India-rubber. You may waterproof it by treating with a solution of 1 part gutta percha in 10 parts turpentine mixed with 10 parts linseed oil, or with 125 parts soluble gun cotton dissolved in 425 parts ether, mixed with 375 parts castor oil and 25 parts umber or the pigment. When the canvas is not to be disturbed, painting or varnishing is the best treatment. For all cases the canvas should be perfectly dry.

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