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.—FLY PAPER.—Will any one give me a recipe for making the paper that, if flies alight upon it, they stick to it?—T. W. S.

2.—STRENGTH OF CITRIC ACID.—How much citric acid equals one dozen lemons?—T. W. S.

3.—PATENT LEATHER.—What composition is used for glazing patent leather, and how is it put on?—S. B. D.

4.—WHITE INDIA RUBBER.—Is there any way in which ndia rubber can be made perfectly white, without destroying its elasticity?—M. H. J.

5.—WIRE FOR SIEVES.—What kind of a wire sieve will withstand the action of salt and guano? Iron sieves or wire will do only for a few days; then they are rusted out and worthless.—A. C. S.

6.—TEETH IN WHEELS FOR CHAIN BELTS.—Will some one inform me of a rule for laying out or spacing off teeth in wheels for chain belts to run on? Different wheels require different spacing for the same chain.—M.

7.—GRINDING LENSES.—I wish to make a powerful lens for a microscope. The one I have is not strong enough. Can some one tell me how I can turn and polish the glass?—E. J. O.

8.—CENTERING LATHES.—How can the conical points of the centers of lathe arbors be ground so that their cross sections shall not vary from circles by more than one ten thousandth part of an inch?—G. M. T.

9.—JAPANESE PAPER WARE.—Can any one tell me how his is made, or put me in the direction to acquire the information?—E. A. W.

10.—PERMANENT ANILINE INK.—Can I make permanent nk from aniline colors? I dissolved rosaniline in alcohol, and to get the proper tint, I mixed it with water and gum arabic. It is a splendid ink, but after a time it fades and washes away.—C. J.

11.—ANATOMICAL SPECIMENS.—How can I prepare anatomical specimens such as are seen in museums? They look as if they were dried.—G. H. J.

12.—COMPRESSIBILITY OF WATER.—Supposing you put water under a pressure of one, two, or three atmospheres; in what proportion does the volume of the water decrease and the specific gravity increase?—L. E.

13.—MAGNETIC CURRENTS.—Will Mr. John Wise the aeronaut, or some other experienced philosopher, inform me whether there is any perceptible variation in the line of magnetic currents, when we rise above the earth, as indicated by the compass?—A. E.

14.—IMPURE WATER.—Owing to the continued drought, the water in the storage lakes supplying our city has become very much reduced, and the water now has an unpleasant taste and smell. What can be put in our pitchers, etc., to purify before using?—J. W. L.

15.—REFRIGERATORS.—Can any one give me general information as to refrigerators? I want to make one on a small scale for family use, and would like to know the materials used and their cost. Would the money required to build an ice house and the labor spent in fillingit be as well laid out in a refrigerator?—W. A.

16.—ENGINE FOR GANG PLOWS.—Could not an engine be built of small power with elevating screws for the boiler, to keep it on a level, and so enable it to be controlled for the purpose of breaking prairie with two or more plows in gang?—A. J. D.

17.—POWER FOR STEAM YACHT.—I am about to build a screw propeller steam yacht, 30 feet long by 10 feet beam. What is the smallest single engine that can be used to run it 15 miles per hour? What ought the diameter of the screw to be, and how many revolutions ought it to make per minute?—W. S. B.

18.—DRYING FRUIT.—Can the heat of the sun be stored up to be used during the night? One of the great wants of the West is a cheap and convenient method of drying fruit. Could the sun's and the waste heat from the cooking stove be so stored that little fuel would be required?—E. E. S.

19.—COFFEE USED IN DYEING.—I saw a statement some time ago in a paper (now mislaid) that a large quantity of coffee was used in the process of dyeing; it was submitted to a hot bath by which certain properties were extracted, then dried and sold for food. Please inform me how I may distinguish the genuine from the adulterated grain.—S. E. M.

20.—FETID WATER.—The water in my cistern has a very disagreeable odor; what can I do to remedy it? On standing a few hours in an open vessel, a scum rises to the top resembling iron rust in color. The cistern is new and so set as to receive no surface water; the roof is also new and is not shaded by trees. Three ordinary iron pumps which are used constantly are attached. The top is kept covered.—F. D. H.

21.—TINNING IRON.—Can any one, familiar with processes or tinning iron, tell me if glycerin will do for dissolving sal ammoniac or muriatic acid, so that the articles when properly cleaned can be dipped from this preparation into the melted tin? I have used a solution of sal ammoniac in diluted muriatic acid, and dipped the articles in powdered rosin before dipping into the tin. I have also used melted tallow instead of powdered rosin, but I wish to use something which is easy to remove from the articles after tinning, and which will not rust iron nor injure silver plate.—W. S. H.

22.—PRIMING OF BOILERS.—I have a boiler ten feet long with 40 two inch flues and a steam dome on top; the engine is estimated at 30 horse power, with 60 pounds of steam. As sure as we let steam get down to 50 pounds, the water gushes out at the safety valve and the cylinder chokes. Can you explain to me the trouble? I contend that the pipe from the engine is too long; it is 12 feet, and consequently I think it gives room for the steam to condense.—S. M. P.

23.—RED ANTS.—In your issue of July 20 is an item informing the public that red ants throw out a liquid substance from their bodies. Now tell us, gentlemen, how we can throw out the red ants altogether from our cupboards. How shall we be rid of the red ants themselves? Salt has been said to be an antidote, but a trial of it proves that salt don't scare worth a cent. What will do it?—J. C. 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 1·00 a line, under the head of "Business and Persona."

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

MADRAS WATER WORKS.—J. S. L.'s Madras *Athenæum* has not come to hand.

A SHOWER OF POLLEN.—A. V. P., of Mich., says: We had a heavy shower yesterday, and with the rain there fell a large quantity of the yellow powder, a specimen of which I enclose. The impression here is that it is sulphur. One person claims that it is the sulphur that would have been burnt up had the cloud been accompanied by lightning. I have tried to burn it, but it does not burn; therefore I conclude that it is not sulphur. Thinking you might be interested, I send a sample. Answer: The substance sent is the pollen of a species of pine. A representation of the particles as they look under the microscope may be seen in Wood's "Botany," page 108, Fig. 367. Showers of pollen and *infusoria* are not uncommon, and are always interesting phenomena. The daily papers recently reported the fall of a shower of yellow sulphur at Saratoga Springs during a rain. But it was probably pollen, as above.

MINERAL SPECIMEN.—Enclosed I send you a stone, or something else found among hundreds of others in a small stream of water. They are not all alike. It is very hard indeed. Is it of any value? Answer: The specimen is a quartz pebble. No stone which will yield to the file and grindstone can be diamond. Quartz pebbles, when large and perfectly clear, are used by opticians.

UTAH OBSIDIAN.—I see a little notice on the African diamond fields. Please tell me whether, in those fields, Mr. Paterson has seen multitudes of the dark colored stones of which I send you herewith a specimen. When I found them (on top ground like gravel, and plentiful), I thought of Brazilian diamond fields. I have also seen them on marly soil and metamorphous clay slate shales and green sandstone, mixed with blendish formations of all colors. I had no time to lose, or I would have spent a week to dig and wash the marly ground. But if there be such stones in the African regions, I have every reason to believe I found similar fields here in Utah.—S. Answer: The specimens sent are of volcanic origin. The black is obsidian or black gloss lava, which often occurs in nodules in river sand in Mexico and elsewhere. The other is a known variety. They are interesting to the mineralogist, and are sometimes used for jewelry, but they have an indifferent value. We were not aware that Mr. Paterson found obsidian in the African diamond fields.

STEAM AND COMPRESSED AIR.—To C. B. B.—Compressed air may be used in place of steam to work an engine.

HEATING FEED WATER FOR LOCOMOTIVES.—To A. M.—Several devices have been employed for the purpose; but we cannot say which would be most suitable for your engine.

BOILER SCALE, ETC.—S. M. P. should consult our advertising columns. As an "Engineeer's Guide," Bourne's "Catechism of the Steam Engine" is a good authority, and may be studied by beginners.

STAG HORN BEETLE.—I send you a horned bug for inspection, as I see, by the SCIENTIFIC AMERICAN, that you write a chapter on such things occasionally. These bugs are numerous towards night.—J. F. W. Answer: The bug is the stag horn beetle or *lucanus dama*. Its larva or caterpillar has a rusty colored head, and lives in rotten wood.

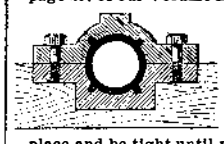
G. H. C., of Conn., sends some mineral specimens, requesting to know their character. We reply: The golden spangles in the quartz rock are pyrites. The black specimen appears to be tourmaline, but the fragment is too small for safe determination.

SOLID AND HOLLOW IRON SHAFTS.—Which would sustain the greater weight, a solid cylinder of iron two inches in diameter and two feet in length, or a hollow cylinder of two inches external and one inch internal diameter of the same length? Each is supposed to rest horizontally, supported at the ends, and the weight rests upon, or is suspended from, the middle of each cylinder.—S. S. Answer: Assuming that average cast iron be the material employed, the quiescent breaking load of a solid cylinder of the specified dimensions would be about 5,040 pounds, while that of a hollow cylinder would hardly exceed 3,808 pounds.

L. S. F., of O.—The issue of June 22d closed the volume of 26 numbers commencing January 1st. The next issue was dated July 6, no intermediate paper being issued.

PRINTING QUESTIONS.—To M. W. Z.—Two of your questions are business enquiries, and could not be definitely answered by us or our correspondents. Every maker will recommend his own goods, and prices vary considerably. Pay a fair price to a reputable manufacturer, and stick to him as long as he sends you the right thing.

AQUARIUM CEMENT.—R. C., of Ill., will find a good recipe on page 267 of our Volume XXV.



METAL LINING IN CAST IRON BOXES.—Let W. A., query 12, on page 416 of Vol. XXVI., drill a few holes at an angle on the inside of his boxes, partially through the metal. The melted Babbitt metal will run into these holes, forming lugs which will effectually keep the metal in place and be tight until worn out.—S. G. S., of N. Y.

TAKING IMPRESSIONS ON PAPER.—Query 19, page 10.—Impressions can be taken by coating a piece of thick paper with oil and olding t over the flame of a candle or lamp until it is smoked black. Any kind of oil will answer, though linseed is the best; little oil should be used.—E. E. S., of O.

FORCE OF FALLING BODIES.—In view of the difference between the two answers to J. E., query 12, June 8, and of my own ideas, somewhat different from either, I would say: The striking force of a moving body, in whatever direction it moves, is its momentum. Its momentum is the joint result of its quantity of matter and its velocity. The ratio of this momentum to that of other moving bodies is compounded of the ratio of its quantity of matter, which is indicated by its weight, and of its velocity at the instant in question. Its momentum, therefore, is not weight any more than it is space or time, and it cannot be expressed by pounds, in the ordinary sense of that word, any more than by feet or by seconds, nor is it expressed by any two of those terms. To obtain a statement of the momentum of a body for the purpose of comparison: Multiply its weight by its velocity—its number of pounds, for instance, by the number of feet it would move in a second if it should proceed for a second at the rate for the instant in question. The velocity of a falling body is continually accelerated, and it increases not as the space fallen over but as the square root (query? ED.) of that space. Therefore to multiply the weight by the space fallen over will not give the momentum. The velocity of a falling body at the end of one second of its fall is 32 1-6 feet per second, and it has fallen one half that distance. It will fall 4 1-48 feet in half a second, and its velocity is then 8 1-24 feet in half a second. The velocity at four feet descent is nearly the same, but more exactly is 16·0312 feet per second. This multiplied by the weight in pounds gives the momentum. The general formula is: The square root of (64·38 multiplied by the distance fallen)—the velocity, and the velocity multiplied by the weight—the momentum. So much for determining the momentum. The extent of change produced by the blow of a hammer has a compound relation to the force of the blow and the ability of that which it strikes to resist. Some obstacles resist in proportion not only to intrinsic power, but also to the time during which they exert their resistance, and their resistance to a blow is less as the velocity of the blow is greater. Such are the different attractive, repulsive, and expansive forces, and such is substantially the case where springs are to be bent and where many forms of cohesion are to be overcome. In such cases, the change produced is as the weight multiplied by the square of the velocity, and in case of a falling body is as the weight multiplied by the distance fallen. Other resistances are independent of time, and are in proportion to the space over which the resistance operates. Such is substantially the case of friction. Here the change is as the momentum of the blow. It is so in the case of bodies resisted by the momentum or inertia of other bodies, or, as in greater or less degree is the case of a body moving through liquids, of the particles of bodies. The case of forging with a hammer presents a compound of both these kinds of resistance, varying in their proportions with the nature of materials, degree of heat, and other considerations.—G. M. T.

Recent American and Foreign Patents.

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

ARGAND LAMP BURNER.—Joseph Ravoux, of New York city, assignor to himself and Lucien Knapp, of same place.—This invention relates to improvements in the construction and arrangement of lamp burners which are adapted for the reception of annular wicks, and has for its object to improve the flame by a more perfect system of admission of air. It consists in admitting air at the base of the flame of an argand burner by means of perforations in the concentric tubes which enclose the wick. The upper ends of the tubes are bent apart—the inner one inward and the outer one outward—to allow free passage to the air.

BIRD'S NEST.—John A. Deknatel, New York city.—This invention furnishes an improved wooden bird nest which is made in two pieces, each turned out of a single piece of wood, and japanned both inside and outside.

PAINTER'S PALETTE.—The improvement in this invention consists in adjustably attaching to the palette a clamp, by means of which it can be attached to any suitable fixture and thereby rendered more useful in sign and ornamental painting. It may be used without the clamp, in the usual manner. Oscar Le Roy Andrews, of Boston, Mass., is the inventor of this improvement.

CELL COVER FOR SEWING MACHINE TABLE.—George Alfred Wheeler, Worcester, Mass.—This invention consists in arranging a series of cells, in sewing machine or other tables, in a row, and providing them with sliding covers which adjoin and all slide in the same direction when being opened or closed. A spring acts on one end cover, and through that communicates motion to any or all of the others so as to close them.

AUTOMATIC BELL RINGING APPARATUS FOR LOCOMOTIVES.—James S. Lamar, Augusta, Ga.—This invention consists of a crank shaft which is mounted on the locomotive and provided with a friction wheel or a gear wheel in such a manner that it can be readily geared or ungeared with one of the axles. The bell is connected to the crank by a cord and is rung automatically when the locomotive is in motion; thus saving the labor of ringing it by hand, which is considerable in large towns where the distances along which the bell is required to be rung are long.

SAW GUIDE.—James Arthur, Anoka, Minn.—This invention produces a saw guide which can have its jaws adjusted while the saw is in operation without exposing the operator's hands to dangerous contact with it, and in which, furthermore, either jaw can be adjusted independently of the other.

WHEEL PLOW.—Guy Tozer, Jackson, Mo.—This invention furnishes an improved plow which is designed more particularly for tight clay soils, but which may be used with advantage in other soils. It is so constructed as to open the bottom of the furrow so as to drain off surplus water from the roots of the grain and prevent them being chilled by it in cold weather or scalded in warm.

ROTARY STEAM ENGINE.—George H. Whitcher, South Brooklyn, N.Y.—This invention furnishes an improved steam engine, which is so constructed as to give a constant and steady motion, and which may also be used as a pump, if desired; it consists in combining two steam cylinders with two other smaller cylinders eccentrically shafted within them, and a horizontal piston. The construction, which would not be understood from a verbal explanation alone, insures the rotation of the inner cylinders and their shafts when steam is admitted.

PORTABLE HOUSE.—Harvey W. Forman, Centralia, Kan.—The invention relates to an improvement in that class of house whose parts are detachable, in order to admit of being packed and transported conveniently and cheaply from one place to another. It consists in a new arrangement of parts with a view to increased lightness, strength and durability of the structure.

HATCHWAY GUARDS.—Edward H. Ball, of New York city.—This invention furnishes an improved guard for elevator and other hatchways which is so constructed as to be raised by weights automatically into position as the hatch is opened. When shut down, it is secured in place by a spring bolt which is released by the rising hatch.

LIFTING JACK.—Charles Maynard, of North Topeka, Kas.—The object of this invention is to render more useful and effective the ordinary lifting jack for wagons and other wheeled vehicles; and it consists in connecting the parts so as to cheapen, simplify, and improve the construction without involving any material alteration in form.

HED'DLE CONNECTION FOR LOOMS.—Thomas K. McIntyre, of Warner, N. H.—In this invention, metal straps are used for connecting the various parts of looms instead of the ordinary leather ones. They are cheaper and more durable. The strap is made in two toothed pieces which are joined by a sleeve which is drawn over the parts where the teeth mesh. By this construction its length is easily adjustable.

MILK STRAINER.—Richard G. Kendall, of Fairweather, Ill.—This invention relates to a useful improvement in milk straining buckets or pails, and consists in a new mode of making the strainers detachable from the bucket, so that they may be changed or removed with facility. The strainers are made with a grooved frame which slides on to lips on the spout of the bucket.

FENCE.—Israel L. Landis, Lancaster, Pa.—This invention is an improvement on a fence patented by S. H. Rose, September 25, 1866, and it consists in combining, with the pins that pass horizontally through the posts and support the panels in an upright position, other pins that pass transversely through bottom strips of the panels and prevent the panels being raised by small stock in its effort to pass under the same.

FRUIT DRYER.—Judson Allen, of Everett, Mo.—In this improved dryer an air chamber is arranged below the drying chamber and above the heating chamber, which receives air from the sides of the case, and delivers it through its perforated vertical side walls to the drying chamber above, so as to prevent too much heat radiating through the bottom plate. At each corner of the dryer is a hot air conductor, which can be adjusted either to turn the heat into the dryer, or to allow it to escape through the top. On the front of each conductor are deflecting plates which cause an equal distribution of the heat in the drying chamber.

MEDICAL COMPOUND FOR HEART DISEASE.—Michael D. Britten, of Eaton, Mich.—This invention relates to a new and useful improvement in the curative art; and consists in a compound composed of the pitch of *pinus origide* beech bark and the heart of the iron-wood tree, all steeped in alcohol moderately for several hours.

FRUIT CRATE.—Elijah B. Georgia, Clifton Station, Va.—The invention consists in a fruit and vegetable crate consisting of top and bottom frame slatted and connected by slats nailed to their inner sides.

ADJUSTABLE STAND.—Matthews Stahn, Baltimore, Md.—This invention consists in a triangular stand for photographer's use, formed in two hollow sections, one of which is raised or lowered within the other by means of a windlass, and held by clamp screws.

WATER WHEEL.—John Frank, Chester, O.—The invention consists in adjusting a water wheel vertically by means of slotted uprights, a tenoned bridge tree, and an adjustable wedge support; in attaching the buckets by mortise and tenon to a central hub and then holding it by a single band and a bolt to each bucket; in giving a gradual curve, then a quick rise at the end, and then a relative hight and width to the buckets; and finally, in making the cup in sections, detachably held by cross rods on the inside and bands on the outside.

CULTIVATOR.—Frederick W. Tolley, of Coxsackie, N. Y., assignor to himself and Albert V. D. Collier, of same place.—This invention furnishes an improved cultivator, which is so constructed that it may be conveniently transported from place to place. It is provided with wheels which standa little above the surface of the ground wheu in working position, and by the aid of which it is moved over obstructions. The frame also admitsot being turned over forward so as to rest on these wheels, in which position the cultivator can be drawn about with the same facility as a cart.

DRAFT REGULATOR.—Joseph Woodruff, of Rahway, N. J.—This invention relates to a new apparatus for regulating the draft of the furnace in accordance with the steam pressure of a boiler, so that the furnace heat is automatically reduced whenever the pressure exceeds a given degree, and is augmented when the pressure falls below a desired point. It consists in an arrangement of flexible diaphragms, connected with a vertical stem, which when adjusted up and down, by the action of steam on the diaphragms, causes vibrations in a weighted lever, and the consequent automatic adjustment of a damper which is connected with it.

BRAID GUIDE FOR SEWING MACHINE.—Eddy T. Thomas, of Boston, Mass.—This invention consists in the arrangement, within a sloping or diagonal slot in the presser foot, of a cylindrical guide piece, which is provided with a circumferential V-shaped groove and adapted to be turned or rotated on its axis, so that the passage for the braid may be enlarged or contracted in width to accommodate wide or narrow braids.

ANIMAL TRAP.—George F. Lampkin, of Georgetown, Ky., assignor to himself and James Y. Kelley, of same place.—This invention furnishes an improved trap for catching rats and other animals, which is so constructed as to catch any number of animals without frightening the others, or leaving any scent in the trap to warn them of the danger.

BED BOTTOM.—Henry B. Ramsey, of Rockville, Ind., assignor to himself and Wells C. McCool, of Guthrie Center, Iowa.—This invention relates to a new arrangement of the supporting springs and cross bars of a bed bottom. The slats are, by screws or nails, firmly secured to the cross bars, and strips of leather or rubber are interposed between them to prevent wear and squeaking. To the middle of each cross bar is secured, at the under side, the middle of a supporting spring, the ends of which are free and project downwardly. The springs rest on the bedstead rails and are padded with rubber or leather. In order to strengthen the springs and give a more firm support to the cross bars, cushions of rubber, or spiral springs, are placed between.

GRATER.—Josiah A. Hard, of Lawrence, Kansas.—This invention relates to a new grater for nutmegs, horse radish, and other similar purposes; and consists in the use of a rotary grating cylinder contained within a stationary cylinder, and hung on a frame in such a manner that it can be withdrawn from the outer cylinder and detached from the frame whenever desired. See advertisement on another page.

RATCHET.—Thomas Searls, of Pottstown, Pa.—This invention furnishes an improved ratchet, which is so constructed that it may be readily adjusted to revolve the shaft in either direction, or to let the shaft stand still while the ratchet continues to work. It consists in a toothed wheel which is attached to the shaft, and two pawls which are placed on opposite sides of the wheel and turned in opposite directions. By the aid of springs and other appropriate mechanism, the pawls, or either of them, are made to engage with the wheel or not, as required.

BRICK MACHINE.—Henry Bulmer and Charles Sheppard, of Montreal, Canada.—This invention relates to an attachment to brick machines, by the operation of which the clay is pressed into the mold at suitable pressure and the molds, when filled, are pushed out from below the drum without manual labor. The machine may be worked by steam, water, or horse power, and will, with the same attendance, manufacture a greater number of bricks than the devices for the same purpose now in use.

MACHINE FOR THROATING SPOKES.—Joseph B. Stanley and Matthew D. Smith, of Tough Kenamon, Pa.—This invention relates to a new machine for throating the spokes of wagon or carriage wheels, facing the same, and tapering them toward the outer ends. It consists in the arrangement of an eccentric support for the spoke while in contact with the cutter, so that the cut may be tapering to make the spoke thinner on the face than at the back. The invention further combines various other details of improvement.

THILL COUPLING.—James T. Hards, of Geneva, Ill.—This invention furnishes an improved thill coupling which may be coupled and uncoupled without trouble. The clip and yoke of the coupling are constructed and attached to the axle in the ordinary manner. Upon the forward arm of the clip, above the end of the yoke, is formed a chamber having a rectangular hole formed through it to serve as a socket for the head of the thill iron. The front bar of the chamber is concaved upon its inner surface. The head of the thill iron is made convex upon its forward side when in working position, so as to fit into and rest against the concaved surface of the chamber and support the draft strain. The head of the thill iron is slotted transversely upon its rear side to receive a pin which passes through the side bars of the socket, and is riveted or otherwise secured to it. The pin serves as a hinge to the thilliron, and also to support the strain in holding back. By this construction the thill irons can be readily raised from the socket, but the coupling cannot become uncoupled when the thills are in any position in which they can possibly be while attached to a horse.

MITER BOX.—Andrew Clayton Hall, of Carbondale, Pa.—This invention relates to a new form of saw guides, and to a new combination of the same with the posts and swivel bar of a miter box, which greatly improves the general arrangement of the parts. It consists, first, in making the guides laterally adjustable on vertical slides, so that they can be fitted to any thickness of saw blades; and, second, in combining said guides and slides with two slotted posts, of which one constitutes the pivot of the horizontal bar to which the other is secured.

SAD IRON STAND.—George O. Ballou, of Fall River, Mass.—This invention consists of a sad iron stand made of metal or other suitable substance, the top of which is recessed so as to form a receptacle for an appropriate polishing composition; thereby forming a convenient and serviceable article for the laundress.

MACHINE FOR MAKING BARRELS.—William Brown, of St. Louis, Mo.—This invention relates to improvements in machines for crozing, chamfering, and leveling or trimming off the ends of the staves of barrels; and it consists in a hollow shaft which carries a radially grooved disk, in the grooves of which the sliding tool stocks are mounted, and a second shaft which works within the first and carries a cam arrangement for giving radial motion to the tool stocks. The latter is geared to the wheel that drives the hollow shaft by a wheel having a different number of teeth, so that the speed of the two are unequal. In this way the first shaft operates the tools and the second moves them toor away from their work, so that they may be easily inserted in or drawn out from the barrel. The machine is provided with a sliding table which carries the tools, and a ring in which the barrel is held.

STEAM BOILER.—James N. Paxman and Henry M. Davy, of Colchester, England.—In this invention an annular vertical boiler surrounds its fire box and vertical flue; and bent water tubes are placed in the fire box, which connect at their lower ends with the sides of the annulus and at the upper with the crown sheet. The improvement in these tubes consists in making them taper or contracted at their lower bent ends, where the colder water enters, so as to impart a scouring action to the current and prevent incrustation. They may also be provided with ribbed plugs so as to further lessen the passage and increase the effect. Deflectors are placed in their upper ends to direct the water laterally and downward, and various other improvements are made in the boiler generally.

CURTAIN FIXTURE.—Stewart Hartshorn, of New York city.—The object of this invention is to simplify, cheapen, and improve the stop motion of spring curtain fixtures, and it consists in attaching to one end of the roller a cap, or case, in which are placed several loose pawls, so arranged and of such form as to fall against and engage with recesses in the spindle of the roller by their own gravity. When quick motion is given to the roller, either in letting up or pulling down the curtain, centrifugal force throws the pawls outward from the spindle, but upon slackening the motion one or the other of them drops and stops the curtain.

STEREOTYPE BLOCK.—Robert P. Tickle, of London, England, assignor to George Holt Mason, of same place.—This invention relates to an improved means of mounting and securing stereotype and other plates in a printing press, whereby a great saving of time and labor is effected, inasmuch as the the use of the ordinary chases, leads, and other pieces, technically called furniture, is dispensed with. It consists in providing the bed with parallel oblique bars which are of T form in cross section, and to which are attached the plates by screw clips and nuts, or their equivalents.

SOLDERING ROD.—William M. Neill, of Bridgeport, Conn., assignor to himself and S. D. Roberts, of New York city.—This invention relates to soldering tin roofs more especially, but is adapted to other purposes. Tin roofs are generally soldered with resin and solder separate, and the resin frequently becomes displaced by jarring, or is blown away by the wind. These difficulties are overcome by making a tube of the solder and filling the same with resin, or by combining the resin with a rod of solder, in such a manner that both are applied at one time and in proper proportions.

CHAIR.—Randolph S. Mains, of New York city.—This invention consists in an adjustable chair of very ingenious construction which can hardly be explained verbally. It admits of being made to assume seventeen or more different forms, and of being put to nearly as many different uses. From the simple chair, it can be converted into several forms of easy and invalid chairs and sofas, and parts of the apparatus are so contrived as to act as tables, reading desks, etc., in combination therewith.

THILL COUPLING.—John H. Morgan, of Lebanon, Ind.—This invention furnishes an improved coupling for thills or shafts, tongues, etc., which is so constructed that, while coupling the thills or tongue securely, it may be easily and quickly uncoupled. A yoke, the forward end of which consists of two projecting lugs, is fastened by clips to the axle. The lugs have inclined slots formed in them, extending downward and forward from their upper edges, to receive a bolt which is attached to eyes formed upon the rear ends of the branches of the thill iron. The forward parts of the thill iron are secured to the rear end of the thill, and the rear parts are branched to receive the lugs between them. By this construction the bolt can be readily passed into and out of the inclined slots in the lugs. The fastening or unfastening is effected by means of a hook which is pivoted between the lugs and which falls over the bolt so as to hold it securely in place.

DOUGHNUT CUTTER.—John F. Blondel, of Thomaston, Me.—This invention furnishes an improved device for removing the dough from the cutter tube automatically; it consists in the combination of a spring and follower with the center tube in such a manner that the spring is compressed when the dough is cut, and the dough in the tube pushed out by the recoil of the spring.

PAPER PULP MACHINE.—John M. Burghardt, of Great Barrington, and Frederick Burghardt, of Curtisville, Mass.—The object of this invention is to provide improved means for reducing wood to pulp for the manufacture of paper; and it consists more particularly of a revolving grinding emery wheel which is hung on a horizontal shaft and surrounded by a curb or casing. The casing is provided with apertures on each side of the grinding wheel to admit the wooden blocks which are to be reduced, and which are automatically fed up to the wheel by an ingenious arrangement of mechanism.

IRONING BOARD.—Leander N. Vallett, of Providence, R. I.—This invention relates to a new device for fastening ironing boards to walls or upright standards and for bracing them, so that they will be securely held in place. It consists in a new form of sockets on the end of the board, and in their combination with hooks on the wall for entering the sockets; and also in a novel arrangement of ears under the board for receiving the projecting tenons of the supporting brace.

HARVESTER DROPPER.—Richard A. Roberts, of Salisbury, Mo.—This invention furnishes an improved side dropper for harvesters, which is simple in construction, light, and not liable to get out of order; it drops the grain in gavels at the side of the machine, so as to be entirely out of the way when making the next round.

BRIDLE BIT.—James Burns, of East Topham, Vt.—The object of this invention is to provide means for rendering the common bridle bit effective for controlling restive, vicious, and runaway horses, and it consists in attaching to one or both of the parts of the bit one or more lugs or staples, which bear against the roots of the tongue or other sensitive part of the mouth when the reins are drawn.

CIGAR MACHINE.—Webster H. Pease, of Fulton, Wis.—This invention relates to a new machine which prepares the tobacco to be used as a filler for cigars by rolling it into shape and binding and cutting it with great rapidity. It consists in a new arrangement with rotary knives for cutting the filler leaves into strips; of grooved rollers for collecting them into cylindrical form, and of a winding wheel for tying the filler with string or applying a wrapper. It also consists in the combination, with the foregoing, of an endless apron on which the filler leaves are fed along in the desired manner, and in the arrangement of rotary cutters for cutting the completed cigars or fillers in proper lengths.

MATTRESS AND CUSHION TACKER.—Thomas A. Watson and Alfred H. Phillips, of Brenham, Texas.—This invention was alluded to in our article describing the mattress stuffer invented by the same parties, at page 350, Vol. XXVI. It is an apparatus for finishing the mattress after it leaves the stuffer, and consists in a simple arrangement of a slotted sliding table (on which the mattress is laid) and gangs of needles which are made to pass through the mattress and the slots. The needles are then threaded in eyes near their points, and upon and by their withdrawal the tacking and stuffing is accomplished.

RAILWAY CAR TRUCK.—Jose S. Camacho, of Habana, Cuba.—This invention has for its object to insure the proper position of wheels of railroad cars while running on curves, and consists in the arrangement of a swivel frame holding two pairs of wheels in such a manner that each wheel can turn independently of the others.

TRACTION ENGINE.—Louis A. Herrmann, of Paris, France.—The principal feature in this invention consists in propelling the engine by four legs and feet, which are made to move, two and two, in the manner of a four footed animal, They are worked by steam power, and are compelled to sustain the weight of the engine in making the steps so as to cause the necessary adhesion of the foot to the ground. The invention is very comprehensive and includes all the parts necessary to a highly efficient and manageable traction engine.

HAT SHADE.—Marcus L. Battle, of Bainbridge, Georgia.—This invention relates to an improvement in shades designed to form extensions of the brim of a hat. The shade is made of linen, or any other suitable material and is kept distended by a circular steel hoop secured in its outer edge. It is made double, the upper part having a central aperture to receive the crown of the hat, and the lower part being made with a somewhat larger opening. An elastic cord is secured to each part around its inner edge and thus the tension of these, as opposed to the hoop, keeps the shade distended so as to be flat and smooth. The cord in the upper part serves also to keep the shade in position by embracing the crown of the hat.

LEGS FOR TABLES AND STANDS.—George H. Bell, of New York city.—This invention relates to a new construction of the bent legs used for the support of tables, chairs, etc. The leg is made of several layers of veneer glued together, and is bent to the requisite form and carved or ornamented in a suitable manner. Thus made, the legs are very strong and durable, the glued veneers holding shape far better than single pieces.

SPEAKING TUBE ANNUNCIATOR.—Robert May, New York city.—This invention relates to an improved mechanism, which, when connected with a speaking tube, constitutes an index and an annunciator to call an attendant and show at which tube response is required. It consists in combining a drop ball or swinging plate, which is set in motion by air blown through the speaking tube, with a balanced lever, which latter serves to establish, when moved by the displacement of said ball or plate, an electric circuit by means of which the annunciator is actuated.

PILE REMEDY.—Lizzie E. Brady, Gatesville, N. C., assignor to herself, John Brady, and Annesia Langston, same place.—This invention provides a medical compound for the cure of the disease named, composed of one fourth of an ounce of tincture of opium to three fourths of an ounce of water and half an ounce of pure gum arabic.