

ON TRIAL!!! The new INDEPENDENT \$2.00 monthly, "THE SCIENCE OF HEALTH," sent three months for 25c. by S. R. WELLS, 389 Broadway, N. Y.

Facts for the Ladies.—Mrs. Thos. L. Smith, Wellsville, N. Y., has used her Wheeler & Wilson Lock-Stitch Machine eleven years, without any repairs, and one needle—No. 2—for nearly five years. See the new Improvements and Woods' Lock-Stitch Ripper.

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.—EXTRACTING SILVER FROM WASTE PRODUCTS.—I have a quantity of chloride of silver, containing also cream of tartar and common salt. How can I convert this into pure silver, or into the nitrate?—J. H. P.

2.—BLEACHING SHELLAC.—I am using shellac varnish for varnishing my negatives, but it gives them a color which I do not like. How can I remove the color, or bleach the shellac?—L. Q. B.

3.—DISSOLVING SHELLAC.—Is there any process by which shellac can be dissolved in water? Is there any way in which more than the usual amount may be dissolved in alcohol?—L. Q. B.

4.—PAINTING TIN ROOFS.—What paint is best for tin roofs? What time of the year is best to put it on? Should the old paint be removed before the new is applied? How long ought the best paint to last on a tin roof?—L. M.

5.—FREAKS OF BOILERS.—On August 16, 1871, we began to use a second hand boiler; in a few weeks, it began to leak, and the iron showed fine cracks. We had a patch put in, and it gave out in a few days. Then we put in a new sheet; it lasted a few days, bulged badly, and sprung a leak. Then we put in a new boiler, made of the same iron as the sheet put on the old boiler, and fired up at 6 o'clock A. M. At 3 P. M. two sheets bulged; we put in two new ones, and ten hours afterwards these were as bad. We then put in three new sheets; these ran for a few days and then gave out. A boiler inspector says that it was the fault of the fireman; can this be so?—G. & B.

6.—BURNING GAS.—I have an ordinary gas fixture burning 5 feet of gas per hour, and if I attach, by a piece of rubber tubing, an argand burner, I get more light. Can I possibly burn more gas per hour than I did before the argand was attached? It has been asserted that the argand greatly increases the draft and has the same effect as though the pressure was increased in the street mains. On the other hand, it is claimed that no more than 5 feet of gas can come through a 5 foot burner. How is it? Argand burners would be more frequently used but for the impression that they are very much more expensive.—M.

7.—HYDROGEN LAMP.—Your description of the hydrogen lamp will not, I fear, satisfy expectation. It requires refilling too often, and sulphuric acid is difficult to procure in country places. The commercial acid sold in the shops is valueless, as it acts but very feebly on zinc. I therefore propose, as a substitute for the hydrogen lamp, a battery and a platinum wire (if practicable) and I would like to ask if a platinum wire heated to whiteness by a battery will ignite an alcohol or kerosene lamp? What kind of battery would be most suitable and least expensive for this purpose?—J. H. P.

8.—EXHAUST STEAM IN A STEAM JACKET.—Some engine builders surround their cylinders with a chamber through which the exhaust steam is passed, imagining that such jacketing affords protection against loss of heat from the cylinder. I have long suspected that this was a mistake, and that the exhaust steam would carry away more heat than would be radiated from the naked cylinder, even in cold weather; but I am not in possession of any data from which I can estimate the extent of such loss, if any. Can you or any of your readers give me or refer me to any? Some builders take special pains to avoid all contact between the exhaust steam and the shell of the cylinder, while others, among whom are some prominent eastern builders, seem to be indifferent in the matter.—J. W. T.

9.—DIAMONDS IN NEW MEXICO AND ARIZONA.—Reports come to us daily of the discovery of diamonds in these territories, and as but little is known about them, will some one please give us information? 1st. What are the origin and formation of diamonds? 2nd. In what localities are they mostly found, high, low, or level, among rocks or gravel? 3rd. What is the best manner of determining or testing which are true diamonds in the rough? 4th. How is the value ascertained? 5th. What is the best manner of locating or taking up claims, as there seems to be no law relative to locating diamond mines in the United States? A large party of miners will go this fall from Elizabethtown, New Mexico, and they know but little of the mode of diamond mining or hunting, although they are well versed in regard to minerals in general.—H. M. P.

10.—BOILER SCALE.—I am running a boiler, 36½ feet long, 4½ feet diameter, with five flues, three of 11 inches, and two of 14 inches. The flues prevent my cleaning it from the inside. There is a hand hole at each end of the boiler, likewise a man hole. The boiler in question has been running three months, the water used is brackish, and has a muddy appearance. In cleaning our well, we get nothing but white sand. The scale or deposit in the boiler is nearly three thirty-seconds of an inch in thickness. I have tried the much talked of anti-incrustators, but without effect. I have also tried potatoes; I put in half a bushel, but perhaps that was not enough. A couple of weeks since, I took out several pieces of this deposit; one piece I put intopure, another in diluted, sulphuric acid. After standing 6 hours they remained undissolved. I had thought before this trial that the scale was lime and salt, but find now that it is nothing but white sand along with a small quantity of clay. I have tried to settle the water, but after standing a couple of weeks, it presents the same muddy appearance; but no matter how cloudy it is, if the rain beats into the tank for but one hour, it will, in a few hours, be so clear that the bottom of the tank can be seen. Now what acts so magically upon this water? Is it not the ammonia in the rain water? If so, cannot I settle it by using ammonia or alum? and how much is necessary for a 60 barrel tank? We removed a locomotive boiler about three months since; the deposit on the sides of the fire box was one fourth inch thick. I wish to find something to suit my case. Every day the boiler gives more trouble in raising steam, and I know the time will come when it will be almost impossible to keep up steam. I know there are many others in a like situation, and if you could give us any advice it would be thankfully received.—E.

11.—CEMENTED FLOORS.—A few months ago I cemented the bottom of my cellar, which had always been dry, clean, and noted for keeping every thing put into it in a satisfactory condition. Now it is all changed. Moisture gathers and remains on the cemented bottom, the whole cellar is damp, moldy, and unwholesome, and nothing will keep. The ventilation is the same as before the bottom was cemented, namely, by windows. It has been suggested that I cement the side walls, which are of limestone laid in ordinary mortar, to keep out the moisture which perhaps was formerly absorbed by the earth floor or bottom. What do you think will be the proper remedy?—J. C. W.

12.—CONSTRUCTION OF LIFE BOATS.—Concerning the necessary points essential in constructing a life boat, let me ask, as nearly all the accidents occur upon steamship routes, or routes frequently travelled: If passengers can only be kept safely afloat until a passing boat picks them up, is it necessarily essential that a mode of propulsion be attached to a boat? Judging from the difficulty of keeping a life boat headed to windward, will a life boat left to follow its own motion lie lengthways in the roughs of the waves, and duly assume another position when guided by the

rudder? Could not a lifeboat, upon a plan allowing the necessary amount of provisions and water, means of signaling, etc., easily launched, capable of riding the waves in the severest storm without fear of capsizing or swamping until succor comes to the passengers from passing boats, be built? I am at present engaged on the plans of a life boat possessing these merits, and I desire to hear some opinions on the subject before completing them.—L. S. F.

13.—RHEOSTAT.—I wish to construct a rheostat or resistance indicator to be used in connection with a galvanometer for testing telegraph lines. Will some one who has a good one please describe it so that any good mechanic can construct one like it? I wish to know what alloys are generally used for the resistances, and in what form. Is it a very fine wire, insulated with cotton or silk, and wound in a coil with the resistances measured off and a switch between each so as to make the combination? What length of wire of some particular number and composition has 10 ohms resistance? I cannot find any details in any text book to which I have referred.—S. C. D.

14.—DISSOLVING GLASS.—Will some of your readers give directions for dissolving glass so that it can be used with a paint brush, and tell me how it should be done so as to retain its original gloss? Can coloring matter be used with it?—D. R.

15.—EXTERMINATING SNAILS.—What is the best method of destroying and preventing snails in wells?—J. A. D.

16.—WATERPROOFING LEATHER.—How can I make thin calfskin leather waterproof?—F. C.

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

CAR FARE BOXES.—C. H. R.'s suggested improvement is already in use.

PACKING AND BLACK POLISH.—E. should consult our advertising columns.

D. F. McE.—We are indebted to this correspondent for a very fine insect specimen. He desires to know what it is. Answer: It is the *dynastes tityrus* of entomologists, one of the largest beetles within the United States. It belongs to the same family as the sacred *scarabæus* of the old Egyptians.

C. W. P., of Dakota, writes: Enclosed please find a number of different kinds of rock, found near Sioux Falls, Dakota Territory. Please inform me if they are of any value. Answer: The specimens are quartz, except the yellow one, which is chalcedony; neither is of any value.

J. N., of Texas, writes: Will you please inform me what kind of ore is the enclosed? We have an abundance of it in our neighborhood. Answer: It is the red hematite ore of iron, which often occurs in concentric layers. It is a very rich ore.

H. A. S., of Me., writes: Please find a solid substance enclosed which a lady found in an egg. I presume it is a piece of coagulated albumen, but I cannot imagine how a portion of the albumen should become coagulated in a fresh raw egg. Can you? Answer: The specimens are condensed portions of the yoke, not "coagulated albumen." We have a similar example on a larger scale in our possession. They consist mainly of globules of oil.

G. W. G., of Ill., writes: Enclosed you will find a mineral specimen found on a relative's farm near Galena. I request you to inform me what it is. It is found in a meadow (lowland) with a spring close by; what quantity there is, I cannot tell. We have had a bucketful tried in the stove and it seems to burn well, but I am at a loss to say what it is. Answer: It is asphaltum, resembling the celebrated deposits in New Brunswick and Trinidad. If abundant, it is valuable.

R. & T., of Georgia, write: We here hand you a sample of what we term, for want of a better name, a mineral polish in its crude state. We have tested it as a polish upon steel, brass, etc., with results highly satisfactory to us. We have burned it, and find that it stands the strongest fire test we can apply without being affected in the least. Answer: The specimen consists mainly of quartz in a finely comminuted state. It differs from tripoli in not being of animal origin. It has probably resulted from disintegration of some granitic rock. It is softer than emery, but for many purposes it would make an excellent polish.

J. L. S. says: On page 160 of your current volume, in an article on writing fluids, you mention the use of chromate of potash (not bichromate). I am a maker of ink, and I want to make an experiment, and I can find no druggist who has or knows of the chromate of potash. Can you tell me where it can be had? Answer: Chromate of potash is a very common substance, and can generally be had of all dealers in drugs and dyestuffs. You can make the chromate by adding potash to the bichromate.

MOUNTING MAPS.—To J. B., of Mo.—In pasting cloth to maps, take common muslin, cut it to size, lay it on a smooth, clean board, and sponge it with water till it lies quite smooth on the board. Paste the map and lay it on the muslin, then rub carefully with a clean cloth till all the air bubbles and wrinkles are gone. Leave it on the board till quite dry, when it will almost fall off and be perfectly smooth.—F. H. W., of Mass.

COMBUSTION OF COAL.—J. S. J. asks how many cubic feet of atmospheric air are required to produce perfect combustion of one pound of coal, bituminous or anthracite? How many feet of air are usually passed, in ordinary practice, through the fire box of a locomotive or stationary engine, for each pound of coal consumed? Answer: 150 cubic feet of air are required for the perfect combustion of one pound of bituminous coal and 30 per cent more air for one pound of anthracite. Perhaps some of our locomotive friends will tell us how much air is generally passed through the fire box of a locomotive.

VERMIN IN DRIED FRUIT.—M. S., query 23, page 138, should put the fruit in a pan and set it over a kettle of boiling water until it is hot enough to kill any insect that may be in it. Then keep the fruit in a thick muslin or paper rack carefully tied or pasted that the worms may be kept out; but it will retain its taste longer if it is put in an airtight jar.—E. E. S., of O.

VARIATION OF THE POLE STAR.—L. H., query 3, page 106, is informed that the present distance of the pole star from the zenith of the pole is one degree thirty minutes.—H. W. G., of Mich.

CUTTING GLASS.—To J. W. A., query 18, page 153.—Cut from the edges of your glass a number of lines to the edge of your circle, taking care not to cross it. Tap gently with a knife or key, and the outer glass will come away in pieces as divided by the lines. Do not cut twice in a place, and do not try to cut both sides.—J. W. P., of N. J.

WATER VERMIN.—To A. H. R., query 19, page 138.—Go to the nearest river or pond, and with a small net (a piece of old mosquito bar will do) collect a dozen or more of the small fishes known as minnows and put them in your cistern, and, in a short time, you will have clear water, the wiggle tails and reddish colored bugs or lice being gobbed up by the fishes.—M. O'R., of Texas.

PAPIER MACHÉ.—W. P. F. will find the information he seeks on page 16, current volume of the SCIENTIFIC AMERICAN.—F. S. B., of Me.

STAINS ON BLACK MARBLE.—To S. M. T., query 1, page 153.

—Wash with a damp sponge; when dry, touch each spot with a solution of shellac in alcohol colored with a little fine lampblack, and continue to do so until the spots are hidden. Then rub lightly with soft cotton slightly moistened with alcohol until you have a fine polish.—E. H. H., of Mass.

NITRO-GLYCERIN.—To O. I. K., query 9, page 153.—Nitro-glycerin cannot be exploded by a common safety fuse.—E. H. H., of Mass.

BISULPHIDE OF CARBON.—To W. H. P., query 14, page 153.—This liquid can be used with safety for the purpose mentioned. It is made by distilling sulphur over red hot charcoal. It can be got from any manufacturing chemist.—E. H. H., of Mass.

SPECIFIC GRAVITY.—To J. P., query 15, page 153.—A body will weigh the same at the equator as at the poles, and specific gravity is the same without reference to latitude.—E. H. H., of Mass.

FLEAS.—I would suggest to T. J. W., query 6, page 153, one method of getting fleas out of the house. Work on the principle of the old adage that the hair of the dog will cure the bite. Our dog carried them away by being allowed to remain in the house through the night. I wash him thoroughly with strong soapsuds, then allow him to remain in during the night. The flea has a great affection for the dog, and consequently in the morning I find him well stocked, and I again take him out for another scrub. This continues to be the case as long as there is a supply of insects.—T. R. J., of Pa.

DETECTION OF SULPHURIC ACID IN VINEGAR.—Vinegars of commerce are frequently sharpened by the addition of sulphuric acid and pungent spices, which can be easily detected by evaporating a half gill in a saucer placed over boiling water. As it boils down, add a little honey. If the grape sugar it contains turns black, it is proof of the presence of sulphuric acid. As the last of the liquid evaporates, the odor of cayenne pepper, etc. (if there be any) can be readily distinguished.—G. H. C., of R. I.

PRESERVING THE EYESIGHT.—To J. H. D., query 18, page 138.—The decay of sight by age is simply a flattening of the eyeball; if you can restore it to its original form, you may dispense with spectacles. I am now near fifty-two years of age, and when I was about forty-five, I found my eyes would get fatigued by reading. I thought I should have to buy spectacles, but just then I saw an article in the *Herald of Health*, "How to restore and preserve the eyesight." The method is this: You shut your eyes, and press the eyeball with the finger and thumb from the outside corner of the eye towards the nose; the finger and thumb must go round the eyeball above and below about five minutes daily. I generally do it before I go to sleep as I lie in bed, because I shall not have to use my eyes again before morning. If you press from the nose outward it will do injury, as that way is for shortsighted people. I have never used spectacles and never expect to; this is written without them by the light of a kerosene lamp.—J. W. P., of N. J.

Communications Received.

The Editor of the SCIENTIFIC AMERICAN acknowledges, with much pleasure, the receipt of original papers and contributions upon the following subjects:

Car-Coupling Dangers.—By C. F. R.
Science and Theology.—By P. D. V.
The improved construction and propulsion of Lifeboats.—By L. S. F.

A Comparison of the Meetings of Religious and Scientific bodies—being a reply to an editorial article in the SCIENTIFIC AMERICAN, on the American Association of Science.—By E. S.

Horse-railroads without rails.—By R. B.
The Polar Sea and its cause.—By J. H. F.
An endless chain of vacuum air cylinders, operating within a water column.—By J. W. S.
Science and Theology.—By M. F. F.
The Day of Rest.—By J. T. N.
On the need of further Legislation relative to the construction of Sea-going vessels.—By W. W.

The late Edward Marcus Chaffee.—By A. R. T.
Force of Falling Bodies.—By G. M. T.
Sulphuric acid in Vinegar.—By R. H.
Old and New Inventions.—By J. H.
Theology and Science.—By G. N.

The need of better mechanism for Cider making.—By E. H.
On Animal Heat and Disease.—By A. B. M.
Car-coupling Dangers.—By G. F. W.
Car-coupling Dangers.—By C. S.
Theology and Science.—By J. E. E.
The causes and dangers of Kerosene-lamp Explosions.—By C. M. H.

Life preserving Garments.—By S. H. S.
Cheap Microscopes.—By C. S.
Milk sickness—Its cause and cure.—By O. S. M.
The frozen well at Brandon.—By C. S.

Recent American and Foreign Patents.

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

SASH HOLDER.—Abraham Perron, of Stevens' Point, Wis.—This invention relates to a new and useful improvement in the mode of supporting and locking window sashes; and consists in a catch made to oscillate by means of a lever, so as to engage with the sash and hold it in any position.

APPARATUS FOR FEEDING THE CHARGE TO METALLURGIC FURNACES.—Giles Edwards, of Tannahill, Ala.—This invention consists in a feeding tube having a charging chamber with a valve at top and another at bottom to graduate readily the amount of fuel and its mixture with the ore, and thus to give the smelter entire control of the quantity and quality of the ascending gases.

BOLT CUTTER.—William F. Strong, of Charleston, S. C.—This invention consists of a peculiar arrangement of the stock, scroll plate, and cap of a chuck for holding and adjusting screw cutting dies or tap holding jaws, whereby provision is made for the application of a scale, adjustable stop bolt, and a stud pin for arresting the dies as they close upon the bolt at any predetermined point, for bolts of any sizes.

WELL TUBE.—Roswell R. Rouse, of Indianapolis, Ind.—This invention consists in making the tubes of cast or malleable cast iron with projecting ribs and perforated, and in soldering over its perforated sides wire gauze of the desired grade, so that, when the perforations are sufficiently large, the change from coarser to finer gauze, or vice versa, will fit the tube to serve as strainer in all manner of material.

WHIFFLETREE.—Jacob M. Isenberg, Huntingdon, Pa., assignor to himself and S. H. Isenberg, same place.—This invention consists of a peculiar arrangement of devices with sliding catch bolts on the whiffletree for engaging and holding the traces, whereby the traces may be detached and the horse let go by the pulling of a cord or strap.

TOOL FOR BELT RIVETING.—Mortimer D. Lawrence, Flintville, Wis.—This invention has for its object to furnish an improved combination tool for use in belt riveting, consisting of handles pivoted to each other, and provided with a cutter, claw, punch, and head.

WATER PRESSURE CHECK VALVE.—Thomas Bailey, New York city.—The fact that water is practically a non-compressible and non-elastic fluid is overlooked by plumbers, and no means are provided to prevent the sudden shocks to which water pipes are subjected when stop cocks are instantly closed and the momentum of a column of water is suddenly checked. This invention is designed to remedy this difficulty, and it consists in a valve in combination with an air chamber. When any stop cock connected with the water pipe is closed suddenly, and the momentum of the flowing water instantly arrested, the pipe will receive no shock nor be in danger of bursting, as the air in the air chamber will receive the shock and be compressed, and thus relieve the pipe. By means of the nut the valve can be adjusted to suit any head of water, and so as to protect the pipe as well as the range boilers connected therewith.

LIFTING JACK.—John J. Stuart, of New York city.—This invention has for its object to furnish an improved jack for raising wagons and other carriages to enable their wheels to be conveniently removed for oiling their axles, and consists of a pipe of suitable length attached to a foot or stand. Within the former slides a smaller tube. Holes are cut in the outer pipe to receive a pin which is inserted beneath the lower end of the inner tube to keep it in place. A lever attached to the exterior pipe has a pawl pivoted to its forward arm. On the free end of this pawl is a hook which passes through slots and takes hold of notches on the inner pipe, thus raising the latter and with it any object under which it may be placed.

SKATE FASTENING.—Edward Lawson Fenerty, of Halifax, Nova Scotia.—This invention has for its object to improve the construction of the improved skate fastenings, for which letters patent No. 121,092 were granted to the same inventor, November 21, 1871, so as to make them more convenient in use, no wrench or key being required to adjust them to any sized boot. The heel of the boot is held in a metallic clamp consisting of a sliding plate actuated by a lever and toothed wheel, which lever may, after being adjusted, be locked. The sole is confined by two side plates which are governed by a third plate resting upon them. This skate can be secured to the foot by a single movement of the lever in the heel piece.

ROCK DRILLING MACHINE.—John Cody, of New York city.—This invention has for its object to furnish an improved steam drill enabling a hole to be drilled in a horizontal direction or at any desired angle; and it consists of the combination of the base plate or frame, hollow post, and branched standard, with the frame of a steam drill to support said drill in such a way that it may operate at any desired angle, also suitable appliances to enable the drill to be fed forward to its work by hand. The drills are fastened to the piston rod in such a manner as to be firmly locked in place and at the same time be easily detached or attached as desired. By other mechanism it is caused to rotate automatically as it moves back after making a stroke.

SUBMERGED PUMP.—David G. Hussey, of Nantucket, Mass.—This invention furnishes a submerged double acting pump, which can be worked at any angle or number of angles, and at any distance from the well or cistern; and it consists in a pump barrel, which is made with flanges at both ends. The inner faces of its heads are recessed to form seats for the valves, which serve as passage ways for the water. The water enters at the upper end of the pump through holes in the head. The piston rod is made hollow. The piston heads are at a little distance apart, and midway between them is a fixed flange. Valves are placed between the piston heads and the flange so as to close the ingress openings for the water through the piston heads, which water passes into the interior of the piston rod through holes in its sides between the piston heads and the flange. The upper part of the piston rod is pivoted to an arm of a three armed lever. The three armed lever is pivoted to any suitable support at the mouth of the well or cistern in which the pump is placed, and its upper arm is extended to enable the pump to be worked from this point when desired. To arms of the lever, at equal distances from its pivoting point, are attached the ends of two rods or chains, which are connected with the ends of the opposite arms of a four armed lever, pivoted to some suitable support at any desired distance from the well or cistern, and at the point where an angle is to be formed in the connecting rods or chains. To the ends of the other pair of opposite arms of the four armed lever are attached the ends of connecting rods or chains, the other ends of which are attached to the operating lever at equal distances from the pivoting point of said lever. In this way any desired number of angles may be formed in the connection rods or chains, so that the pump may be operated from any desired point.

TWEER.—Theodor Gilson, of Port Washington, Wis.—This invention consists of a novel arrangement of the devices comprising a tweer, with a hollow oval headed plug below a large circular opening in the cap, whereby said devices may be adjusted to cause the air to escape both around the oval head in an annular jet, and through the hole of the plug in a central jet, or through either alone, and to vary the quantity discharged through either at pleasure.

SHIRT.—John A. Peters, of Jordauville, N. Y.—This invention relates to the construction of dress shirts for gentlemen's wear; and consists in a device for keeping the bosoms smooth and taking up the slack cloth around the waist. Straps are attached to the body of the shirt beneath the arms, which are buttoned one to the other, which draws the back and the front of the shirt together, so as to bring the surplus cloth between the two straps under the arms.

BAND SAWING MACHINE.—Hosea D. Bliss, of Hamburg, Iowa.—This invention relates to improvements in the class of band sawing machines where in the saw is so hung as to be inclined from a vertical plane when desired; and it consists, chiefly, in the construction and arrangement of parts whereby the standard carrying the pulleys upon which the saw is mounted may be adjusted at various angles to the reciprocating table with ease, dispatch and certainty. The inventor proposes to use a band saw with teeth of such form that it can be reversed by being turned inside out whenever the teeth are blunt on one side. Regular V-shaped teeth, properly upset, will best answer this purpose.

PUMP.—Frederick R. Locking, of Hannibal, Mo.—This invention consists of a long hollow pump piston whose lower end has over twice the area of the upper end exclusive of the water openings, and is arranged in two packings with an air or water chamber between, so that the upper part, which works in a chamber into which the water is forced, displaces only half the water the lower part does, to equalize the discharge as much as possible and produce a continuously discharging single acting pump by the aid of an air cushion in the said chamber at the upper part of the piston. The invention also consists of an air and water packing for the piston produced by empty grooves in the piston bearings, into which the water and air work when the piston is operated, and constitute a packing by obstructing an active or direct flow through the slight space between the piston and its bearings. The invention also consists of the application of a dasher to the cistern or well, suspended from the pump handle by a rod into the water below to stir and agitate and mix the air with it to avoid the pumping of dead water.

FLOW COLTER.—William H. Hoefelman, of Columbus, Neb.—This invention relates to a new plow attachment for causing weeds, stalks, and stubble to be covered by the plow while the same is turning the soil, with the object of removing such stalks, etc., from the way of harvesting machines, which they frequently clog, and of utilizing the same to enrich the soil. The invention consists in the use of a colter applied to the plow beam, and combined with a laterally projecting curved arm for turning the weeds, etc., which have been detached by the colter.

NEWSPAPER FILE.—William R. McNorton, of Livingston, Ala., assignor to himself and Thomas A. Johnston of same place.—This improvement in paper files consists of thin metal bars or plates with a series of transverse pin holes attached to one of the paper clamping bars at right angles and passing through the other, and held by pins and keys to clamp the paper fast between said bars, the pins being passed through the said perforated bars at the back of the clamping bar; and the two clamping bars are clamped firmly against the paper by the said keys, which being slotted are driven under the pins against the paper clamping bar along the perforated bars which come in the slots.

BEDSTEAD.—Dennis O'Leary, of Hubbard, O.—This invention relates to a new simple construction of wrought iron bedsteads, whose parts are united together in such manner that the bed bottom can be raised up or down at will.

ELASTIC PAD FOR CORSET.—Benjamin Bernstein, of New York city.—This invention has for its object to furnish an improved adjustable spring pad for ladies' corsets or other articles of dress, which shall be so constructed and arranged that it may be readily expanded and contracted, as may be required, and which shall, at the same time, be light, strong, and durable; and it consists in the construction and combination of various parts, chiefly made of metal wire, forming a device designed to be inserted in a corset between its inner and outer coverings, the wires being secured to one or both said coverings by sewing, by fastenings similar to hoop skirt fastenings, or in any other convenient and reliable manner.

SASH HOLDER.—Albert R. Judd, of North Adams, Mass.—This invention consists of a pawl for locking the sash shut, and an eccentric pawl for fastening it open, combined in one piece and pivoted to the sash, with a spring and a pair of inclined planes combined with the pivot of the pawl in such manner that shifting the pawl on its pivot to bring either part into action shifts the spring so that it acts upon the one brought into action to insure its taking hold of the window frame or other part it is to act upon.

BLACKING AND BRUSH HOLDER.—Ephraim H. Sweetser, Salem, Mass.—This invention consists of improvements in the construction of the blacking box and daub brush holders illustrated on page 522, last volume of the SCIENTIFIC AMERICAN, by the same inventor. The inventor has arranged the cover to fit over the outside of the cup instead of inside, as heretofore, for preventing the smearing of the lower edge with blacking, which occurred, when it fitted inside, by the accumulation of blacking in the cup. The apparatus is designed both for shoe and stove blacking and brushes, or other polishing matters.

MACHINE FOR MORTISING BLIND STILES.—Mahlon W. Collins, Enfield, N. H.—This invention consists in combining with a pair of stile mortising tools a table and carriage, both movable longitudinally and independently, but the latter carrying the former in an obliquely forward and upward direction. The inventor states that he has arranged all the driving wheels and belts, likely to be injurious to the attendants, inside of the frame, where they are guarded by it, so that there is but little or no danger of accident.

FLUTING MACHINE.—Edward Mortimer Deey, of New York city.—This invention consists of a construction of hollow rollers having gas burners in the hollow spaces for heating them, calculated to prevent the cutting off of the air supply for combustion by the accidental closing of the hollow ends of the rollers by the goods being ruffled. Second, it consists of an arrangement of supports for the gas tubes, by which the supports therefor, heretofore used at the ends of the rollers, where the goods to be ruffled are presented, and which have to be removed each time the rollers are, are dispensed with. Thirdly, it consists of a very efficient and reliable arrangement of apparatus for suspending the upper roller support and raising and lowering it; also, the adjustable pressure springs therefor.

HEATING STOVE.—Samuel D. Tillman, Jersey City, N. J.—This invention consists in the arrangement of a series of elliptical shaped air tubes parallel to each other across the diameter of the radiating chamber. Also in the arrangement of an air heating chamber between the said tubes and the fire box, whereby the largest possible volume of cold air is claimed to be heated in the least possible time. The tubes are placed side by side within the radiating chamber, in such a manner as virtually to divide the chamber into two compartments—the front compartment, with which the fire pot communicates, being the hot smoke chamber, and the rear compartment being the cold smoke chamber. The formation of the tubes being elliptical is the most favorable for the easy passage of the products of combustion between them. The hot smoke and air are passed between the tubes in thin sheets, owing to the small space between the tubes, so that the loss of calorific non-contact with the tubes is quite trifling. All of the tubes are heated simultaneously and to the same degree. The heat of the fire cannot be more fully concentrated upon one tube than upon the others. Another advantage of this arrangement of the tubes is that the radiating chamber can never become filled with soot or ashes, for a rod may be at all times passed up through the open door and smoke hole between the several tubes, whereby they may be cleaned expeditiously without taking the apparatus apart or even allowing the fire to go down. This arrangement, therefore, permits the use of wood or bituminous coal for fuel equally as well as anthracite coal.

TAILOR'S CRAYON HOLDER.—John A. Gooch, Biddeford, Maine.—The case is made open at one edge, and of such a capacity as to receive the marking lead or crayon. A slide placed in the interior of the case may, by turning a screw in one direction, be pushed outward to push out the lead or crayon as it wears away, and by turning the said screw in the other direction may be moved inward to allow the lead or crayon to be pushed into the said case. The lead or crayon is kept from dropping out of the case by the spring which bears against its side. The lead or crayon is made thin to adapt it for use in the case without requiring the said case to be made so thick as to be inconvenient in use or in carrying it in the pocket. By holding the apparatus, while using it, inclined to one side for a while, and then inclined to the other side for a while, the wear will keep it sharpened, and the use of a knife for sharpening it will never be required.

MACHINE FOR NICKING RIB COLLARS FOR UMBRELLAS.—Robert Marshall, Philadelphia, Pa.—This invention consists of a feeding and holding disk, which receives and carries the collars to the milling tool for cutting the groove, and then to a nicking saw for cutting the nicks; a mandrel for rotating the collar against the milling cutter by a continuous rotary motion, another mandrel for shifting the collar in front of the nicking saw, and spacing and holding it for nicking, and automatically operating gear, whereby the blanks, which are delivered by hand or otherwise to the afore-said disk, at intervals as it is intermittently revolved, will be automatically milled or grooved, nicked, and discharged.

VEGETABLE CUTTER.—Thomas Bolton, Northampton, Mass.—This invention consists of a board or plate with a transverse slot extending nearly across it about midway between the ends, and chamfered or beveled on the underside each way from the slot, so that the walls of the latter are thinned down sufficiently to allow the slices to escape. And over the slot is a double edged cutter, a little narrower than the slot, with both edges beveled on the under side, which said cutter is secured to the board at each end on adjustable bearing plates, which are constructed in two or more parts of different thicknesses for supporting the cutter higher or lower on the board according to the required thickness of the slices to be cut. A guide may be placed along one or both edges of the board to keep the vegetables to be cut from sliding off the edges.

BRUSH.—John Ames, Jr., Lansingburgh, N. Y., assignor to John Ames, of same place.—This invention has for its object to improve the construction of wall brushes, known also as flat paint brushes, paste brushes, etc., and which may also be applied to whitewash brushes, so as to produce firmer, stronger, and more durable brushes than the brushes made in the ordinary manner. The butts or roots of the bristles are clamped in the tapering or dovetailed space between the tapering metallic ferrule and the tapering base of the handle, so as to be held firmly and securely in place, rivets or screws preventing the possibility of any of the parts working loose.

BEDSTEAD KEY.—Herrmann Stein, New York city.—This invention has for its object to produce a wrench or key which can be conveniently used on bedsteads for turning the connecting bolts or pins, and whenever a straight or rigid wrench is difficult to apply. The invention consists in connecting the head of the wrench to the shank so as to form a flexible joint, thus permitting the application of the instrument in corners or wherever other ordinary wrenches or keys are difficult to apply. It is a very effective and convenient implement, cheaply constructed of malleable iron and will take the place of the ordinary bed key.

CARD FOR WRAPPING THREAD, ETC.—Hugo Sutro, New York city.—This invention relates to a new form for holding braided or other threads; and consists in notching a card at the ends to produce visible and accurate subdivisions of the skeins wound thereon. This is for the purpose of keeping the skeins so fully separated that they cannot become entangled, and that each skein containing a certain length of thread can be cut apart with its section of card, to furnish a desired measure of thread or braid.

GENERAL JOINER.—David R. Williams, Sr., Paris, Ky.—The invention consists in working lumber across a wood working machine. The supporting frame of the machine does not require more space than about four feet in length and three in width, and is built of substantial wood work. A horizontal carriage is fitted between two horizontal guide rails, on the upper part of the machine, and is connected with a lever which is pivoted to the frame and serves to adjust the carriage back or forward. A horizontal shaft is hung lengthwise in the carriage to receive at its front end the lathe chuck, circular, rip, or cross cut saw, or other tool to be revolved, and is connected with a drum hanging in the lower part of the frame and receiving rotary motion by suitable mechanism, so that the shaft will also be turned. A longitudinal adjustable rest is placed upon two rails of the frame, so that its center pin will be in line with the axis of the shaft. It can be clamped to the rails by suitable means. The carriage can be fastened in suitable position. Vertically adjustable side plates are placed at the sides of the frame upon a separate longitudinally adjustable frame. When the latter is, by means of a screw, moved backward, the plates will be elevated, and they will be lowered when the frame is moved forward. This machine, with proper additions, can be used for tonguing, grooving, planing, molding, and all manner of work.

REFRIGERATOR.—Benjamin N. Hatcheson, of Greenpoint, assignor to Gustave Autenrieth, Hunter's Point, N. Y.—This invention has for its object to improve the construction of refrigerators or ice boxes in such a manner that the escape of the coal filling over the top of the sheet metal lining will become impossible, as well as the entrance of air and moisture from within into the space containing the coal or other non-conducting filling. The invention consists in the use of strips, placed against the flush inner edge of the refrigerator top, and overlapping the face of the sheet metal lining.

BLAST FURNACE CHARGING APPARATUS.—William A. Miles, Salisbury, Conn.—This invention relates to a new apparatus for charging all kinds of blast furnaces with the material to be treated therein, and has for its object to prevent the escape of gases through the charger while feeding the material to the furnace, and also to allow the evening or leveling of the material in the charging vessel. It consists of sliding plates arranged at the bottom of a blast furnace charger, to move simultaneously together or apart, and also a lid combined with the charger and sliding plates which is opened to admit the material to be charged and which, when closed, prevents the escape of gas during the admission of the charge to the furnace.

CULTIVATOR.—Lafayette K. Tipton, Easton, Mo.—This invention, which has for its object to furnish an improved wheel cultivator, consists of a suitably made frame work resting upon two wheels which revolve on journals in short axles. To the rear of this framework two plow beams are so attached as to be susceptible of both vertical and lateral motion. On each plow beam a handle is fastened and also two inclined standards, on the lower ends of which are shanks and plow plates. By means of a hook attached to either plow beam, hooking in a curved rod on the upper part of the framework, the plows can be supported away from the ground in turning or passing from place to place. The lower portion of the framework is of such a height as to pass over the tops of all plants, while space is left between the inner ends of the short axles for the passage of the row of plants so that they may not be injured or broken by being struck. The plow plates can be adjusted to throw the soil toward or from the plants and the plows may be arranged to work further or closer to the row under cultivation.

GLOVE ENVELOPE.—Andrew D. Foster, Sayville, N. Y.—This invention has for its object to furnish an improved device for preserving kid gloves from becoming spotted, soiled, faded, mildewed, or otherwise injured while in the hands of the retailer and in the hands of the purchaser, and not in use. It consists in the preserver made in the form of a long narrow envelope, with the flap at one end left loose for the insertion and removal of the gloves. In the body of the preserver is formed a small flap, so that by turning up the said flap the color of the gloves can be seen by the purchaser or user in making a selection. Upon the face of the preserver is designed to be printed the name, or the name and trade mark, of the manufacturer of the inclosed gloves, the number or size of the gloves, or business card of the dealer.

BRUSH RACK.—Edwin F. Ames, Lansingburgh, N. Y., assignor to John Ames, of same place.—This invention has for its object to improve the construction of the brush rack so as to make it more convenient in use. It consists in making the lower cleat stationary, notched upon its forward edge, and provided with buttons. It furnishes a simple and convenient rack for holding painters' brushes. It is adapted for various sized brushes in the same rack, and is useful in every paint shop.

HASP FOR TRUNK LOCK.—Edward L. Gaylord, Bridgeport, Conn.—This invention has for its object to furnish an improved hasp for trunk locks which shall be simple in construction and convenient in manufacture, so constructed as to hold the hasp out, so that, should the trunk lid fall accidentally, the hasp cannot strike against the edge of the trunk body and be broken, bent, or injured; and it consists in the combination of the spring and plate with the hasp and a slotted hasp plate. The spring, placed in the space between the bar and the hasp is bent, and by its elasticity holds the hasp out, the ends of the said spring resting against flanges formed upon the side edges of the hasp to keep the spring in place.

BAG LOCK.—Edward L. Gaylord, Bridgeport, Conn.—This invention has for its object to furnish an improved traveling bag lock, simple, convenient, and so constructed that it may be unfastened with one hand while the other is carrying the bag, so that the bag may be conveniently opened in the street or other place where it cannot be conveniently set down. An inner plate and the case of the lock are secured to each other and to the frame of the bag by rivets which pass through the said case and plate and through the said frame, so that the lock can be attached to the frame after the bag has been finished. In the side of the case is formed a hole to receive a catch which is attached to a block that slides up and down in a recess formed in the inner side of the plate or in a strengthening plate placed upon the inner side of said plate. To the block is attached a knob, the stem of which passes through a slot in the plate. The catch is beveled off upon the lower side of its forward end, and has a shoulder formed upon its upper side. By this construction, as the catch is pushed through the hole in the case, it compresses the spring attached to the plate. As the shoulder of the catch passes within the case, the said catch is raised by the elasticity of the spring so that the shoulder of the said catch may catch upon the side of the case above the said hole, and thus fasten the bag. The bag is locked by a bolt which is pushed forward along the plate so as to pass beneath the spring.

BLACKING BOX HOLDER.—Robert R. Forrest, Washington, Pa.—This invention relates to a mode of holding blacking boxes during the process of blacking boots and shoes; and it consists in a spring handle or holder constructed of band iron of any shape, or round wire, or of wood, and formed by doubling such metal, so that the bend will form a spring. On one or both sides of the legs of this spring handle, a recess is formed to receive the bottom of the box.

COTTON GIN FLOCK.—James W. Gaines, Clarksville, Texas.—In this invention, by the arrangement of a valve or set of valves in the flue that leads the lint cotton from the gin stand to the lint room, the inventor proposes to throw the lint cotton into different rooms without stopping the gin. In the ordinary way of ginning, the cotton is thrown into one room, so that the gin has to stop until the cotton in the room is baled or packed. By this plan the gin can be kept running; and if there are more than two rooms wanted more than one valve can be used. By having a partition in the lint room, the cotton can be thrown first into one room, then into another.

STOVE PIPE DAMPER.—Warren Wasson and George W. Dungan, Genoa, Nev.—This invention relates to improvement in the class of dampers and their attachments wherein the damper has its spindle prolonged for a handle or thumb piece by which to turn the damper, and this thumb piece has a stud pin projecting backward toward the pipe, parallel with the journals, to enter any one of a series of holes in a circular line around the axis, for holding the damper closed or open, or partly open, the said pin being introduced to the holes or withdrawn by sliding the damper endwise on its axes. The invention comprises a peculiar arrangement of the supports for the plate having the aforesaid series of holes for attaching it to the end of a section of pipe and allowing the other section to be joined to the one having the said plate attached.

CAKE PAN.—William C. Butler, of Louisville, Ky., assignor to himself and W. E. Arnold of same place.—This invention has for its object to furnish an improved pan for baking cake which shall be so constructed that the cake may be removed from the pan when baked without being broken even should it adhere to said pan; and it consists in the detached bottom and tube, constructed to adapt it to be applied to a cake pan.

BELT SHIFTER.—Toppan P. Rodgers, of Taunton, Mass.—This invention relates to the sliding belt hole covers used around belts running through floors to shift from side to side as the belts shift and keep the holes covered; and it consists of raised ribs or ways on the plate, which is attached to the floor for the shifting cover to rest and move on, with guide pins in the said plate projecting upward through slots in the cover to guide the latter, whereby the said cover is not liable to be clogged so as to obstruct its working freely, as when arranged in covetal guides as heretofore, and is rendered practically successful. This invention also comprises a connection of these raised ribs or ways at each end of the belt hole by other ribs of the same height, both for supporting the ends of the sliding cover and for preventing the escape of the water, used in washing the floors, down through the belt hole.

SAP BUCKET BRACKET.—John J. Pellett, of Oconomowoc, Wis.—This invention relates to a new manner of supporting buckets on maple trees by means of vertically adjustable brackets, which are applied thereto without injuring the trees. The invention consists in the use of brackets, which are fastened to the trees by means of wires or cords that embrace the same. By this means the buckets can be applied in suitable position and shifted to different heights from year to year, as may be found necessary.

ROASTING AND DESULPHURIZING FURNACE.—William Bushnell, of New York city, assignor to himself and Joshua Hunt, of Catawqua, Pa.—In operating this desulphurizing and roasting furnace, the inventor commences by charging carefully a layer of coal upon the grates and placing upon it a layer of ore, and thus alternate with a stratum of coal and a stratum of ore, until the furnace is full up to the lower end of the charging tube; and next he fills the charging tube in same manner, graduating the quantity of coal in accordance with the character of the ore, being careful not to use too much coal. He then makes fires in the fire grates and keeps them up until the coal in the stack is fairly ignited, when they are allowed to go out. The charging of the furnace is thereafter performed through the throats of the charging tube, taking care to keep the tube constantly full. The gases generated in the lower part of the furnace pass up through the ore and coal, gradually intensifying until they reach the surface of the main body of the ore at the commencement of an annular chamber, when they burst into flame, and seizing upon the vaporized sulphur carry it speedily into the atmosphere—a result attained by the use of the charging tube and the open annular chamber surrounding the tube and the boiler, and not reached by any other known plan.

SAWING MACHINE.—Enos Goble Budd, of Budd's Lake, N. J.—This invention relates, first, to a frame for supporting and guiding the saw and its operating mechanism, which is to rest upon and be secured to the log to be sawn; and, secondly, to the arrangement of the said mechanism, the same consisting, in the main, of a novel application of a pair of "lazy-tongs," one being always in the act of opening as the other is closing; and, inasmuch as they are connected with the saw, a reciprocating movement of the latter is obtained. There is considerable novelty in this invention and we shall be glad to receive an account of the result when a machine has been put in operation.

PUMP.—James A. Sinclair, Woodfield, Ohio.—The invention consists in a pump cylinder formed of three tubes, of which the innermost is divided longitudinally, the outermost metallic one is in one piece, and an intermediate one is made of cement. By this construction, the inner sectional tube can readily expand against the cement while the latter furnishes an impervious enclosure to prevent contact between the liquid and the outer metallic tube.

STEAM BOILER.—Philip Estes, Leavenworth, Kan.—The invention consists in arranging and connecting certain water spaces with a boiler so as to create a heating surface larger than usual, thus economizing fuel and lessening the cost of generating a given supply of steam.

STRAW CUTTER.—John O. Tyler, Roxobel, N. C.—This invention consists of a straw cutter in which the feeding of the straw is effected partly by gravitation and partly by the cutters, which are made to revolve under a hopper with an opening in the bottom, and some of them are provided with hooks on the points or ends for catching the straw and drawing it down to the place for cutting it into short pieces. The invention also consists of a pair of curved slotted plates, combined with the hopper and the cutters for conducting the straw to the place for cutting it; and it also consists of a slotted plate combined with these sliding plates and the cutters.

BUSTLE.—Sherman Smith and Daniel L. Smith, Skowhegan, Me.—In this apparatus the horizontal ribs for swelling or bulging out the dress are supported on one, two, three, or more strong ribs or stays projecting from the waistband and curving downward, and at the waistband they bend downward so as to extend along the back of the wearer a sufficient distance to constitute a rest for a brace for the upper projecting portions. The arrangement of this brace adjustably both on the upper and lower parts of the stays, or either of them, so as to be adjusted to hold the projecting stays higher or lower, and the apparatus for adjusting, comprises the invention.

SAW MILL EDGER.—George Willett, Friendship, N. Y., assignor to himself and J. W. Hilton, of Bradford, Pa.—This invention relates to a new means for adjusting the top frame of a saw mill edger, and also to a new mechanism for regulating the speed of the feed rollers and reversing their motion. It consists, first, in providing the top frame with pendent racks at the ends, and in combining therewith toothed segments on a rock shaft, so that when the latter is turned the frame will be evenly elevated or lowered, to be adjusted to the thickness of the board to be edged.

HEAD BLOCK FOR SAW MILLS.—George Willett, Friendship, N. Y., assignor to himself and J. W. Hilton, Bradford, Pa.—This invention relates to a new mechanism for feeding the head blocks of saw mills in the carriages; and consists in the employment of two reciprocating ratchet bars, which are operated by crank connections with a rock shaft, and with which spring pawls, that are attached to the head block, are in contact, so fashioned that when the ratchets are moved alternately back and forth the one moving forward will actuate the head block in the desired manner, the other ratchet meanwhile moving back to be ready for its next forward movement, during which to actuate the carriage.

STONE SAWING MACHINE.—George A. Davidson, of Malden, assignor to himself and Horace T. Caswell, of Troy, N. Y.—This invention relates to grooved metal bars which are placed on the platform holding the stone under the saw. Said grooves will be deep enough to let the saws, which are not always exactly level, work entirely through the stone from end to end before striking the bottom of the grooves, and thus the inventor saves the damage to the platform or scantlings, placed thereon to hold the stone in the common way, which are so cut up in a short time as to be worthless.

CULTIVATOR.—William R. Robinson, Mattoon, Ill.—This invention consists in the combination of a pivoted step which bolts the handles of a cultivator to the plow beam, also a brace bar which supports the handle at the desired elevation. The middle part of the braces is made flat to rest upon the upper side of the plow beams, and is secured to said beams by a bolt, several holes being formed in said flat or horizontal part to receive the said bolt to enable the handles to be inclined to either side or adjusted in line with the beams, as may be desired.

WAGON STANDARD.—Patrick Sweeney, Cordova, Ill.—In this invention the stake is driven from the cap plate into the socket, and is readily removed by taking out the bolts. The socket and the cap plate being firmly united together and the plate securely attached to the bolster by bolts (one or more) the stake is well supported without mortising the bolster, and is, consequently, readily renewed or changed, as occasion may require.

PAPER CUTTING MACHINE.—Edwin R. Sheridan and Theodore W. Sheridan, of New York city.—In this invention the paper knife is brought down with great force by means of a hand lever, which actuates segments of gear wheels which mesh in the teeth of racks on the bars attached to the blade. The hand lever is released after making a stroke; a weighted lever carries it back and also raises the knife ready to repeat the operation.

SASH HOLDER.—George W. Richardson, of Columbus, Ky.—This invention consists of a long flat spring in a case next to the sash, with a curved bar behind it, and behind said bar a pinion on a knob spindle gearing with the said bar so as to raise or lower it by the turning of the said knob spindle, by which the said bar, which has the ends suitably formed for the purpose, will be caused to wedge at its ends in between the pinion and the spring, and force the latter against the sash; and this spring is faced with roughened india rubber, or other substance, adapted to hold the sash by friction. The upper end of the said bar holds the sash up and the lower end holds it down.

CONVICT'S SHACKLE.—Peter Runquist, of Stellacoom City, Wash. Ter.—This invention relates to the inclosing or boxing of the jaws of the ordinary or Gardner shackle with case hardened or hardened steel boxes; the said boxes closely fitting the jaws, and closing in upon and to the ring or circle of the shackle, and then riveted through and through the box and jaws with a countersunk rivet. The object of the boxes is to prevent the convict from making the steel hardened jaws of the Gardner or other shackle cut their own rivets.

HOT AIR FURNACE.—Wilmot W. Dodge, Boston, Mass.—This invention consists in a hot air chamber and cold air chamber, separated by a partition, having dampers when applied to a hot air furnace, and also pipes passing through the combustion chamber, whereby fuel is greatly economized.

HOISTING ATTACHMENT FOR THE SHAFTS OF WELL AUGERS.—Henry H. Russell, Maysville, Mo.—The invention consists in providing the shaft of the auger with a collar, band, and pivoted arm. The collar is keyed or otherwise securely attached to the shaft. Upon the collar is placed an open band to the ends of which is pivoted the end of an arm, to which arms attached the lower end of the rope, by which the auger is raised and lowered. The arm, when the auger is being turned, hangs down and thus keeps the rope from being wound upon the shaft, so that it is always ready to raise the auger when required.

PERFUMED OPERA CHAIN.—Solomon Fredrick, New York city.—This invention relates to a method of perfuming jewelry by attaching thereto a vessel or tube closed at one end and containing a piece of sponge saturated with perfume. The open extremity of this reservoir is surmounted by a perforated cover.

BINDERS' ATTACHMENT FOR HARVESTER.—Chauncey G. Price, Aniana, Iowa.—The grain, as it falls by the sickles, is caught by a platform, up an upward extension of which it is swept by a rake. It then passes to an inclined plane down which it slides to the trough, from which it is removed by the binders. The platform upon which the binders stand is bolted to the frame work of the reaper. The binder's tables, upon which the grain is laid by the binders to be bound, are attached to the platform; the gavels may thus be conveniently bound before being dropped from the machine.

DOG MUZZLE.—Charles de Quillfeldt, New York city.—This invention consists in having the portion of the frame of the muzzle under the lower jaw to spring downward and allow the dog to open his mouth as widely and nearly as freely as when unmuzzled, the spring returning the said part of the frame again as the mouth closes.

CIDER MILL.—John McGrew, Ravenswood, West Va.—The invention consists in a cider mill which crushes the apples, conveys the pumice through an intermediate space and delivers it between two pressing rolls, where the juice is expressed, the pumice discharged and the cider conducted into a suitable receptacle.

FEED RACK.—Jabez L. Rhodeback, New Way, Ohio.—This invention relates to a new rotary feed rack, the nature of which is explained by its name. It can be turned or reversed, to be cleaned, and is so arranged that the animals can feed from the ends. The invention consists in composing the rack of rods, which cross a horizontal beam or scantling, and form four racks of which either one can at any time be used.

MORTISING CHISEL.—Lawrence S. Shuler and James Carpenter, of Jeffersonville, Ind.—This invention relates to that class of chisels so made as to draw out of an article the chips and shavings which it detaches from the block. The invention consists in providing the chisel with a roughened or grooved inner face and with similarly roughened lips or side flanges.

LATH MACHINE.—Oliver C. Meigs, Dubuque, Iowa.—This invention consists of a combination of a pair of toothed drawing or feeding disks or rollers with a pair of bolting saws and the ordinary feed rollers; said toothed rollers are suspended by an oblique frame from an axis over the saws, so as to work on the upper sides of the cut bolts and rise and fall with the irregularities of the surfaces of the slabs, said rollers being driven by machine chains worked by drums on the axis, from which the roller-supporting frame is suspended, and said chains are inclosed in cases to prevent them from being clogged with saw dust. The said swinging frame or support for the rollers has chains or links connecting its lower end with a support above, to prevent the rollers from falling too low when the bolts pass from under them.

SCREW DRIVER.—John S. Armstrong, St. John, Canada.—This invention consists of a split or divided plate or bar, whose ends for entering the nick of the screw are each in the form of a frustum of a wedge, arranged so that the narrow ends meet when the two parts, which are capable of moving toward and from each other, come together; with which said divided bar is a handle, and a suitable means for forcing the said wedge ends to gether when applied to the screw. The said improved screw driver is designed especially for screws with nicks widest at the ends and contracting toward the middle, the object being to hold the screw on the driver by wedging the latter into the nick, so that the screws may be guided by the driver, and the latter will be prevented from slipping off the screws while turning them, as does the common screw driver.

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