revolutions per minute, will give 100x100x4=40,000, which, divided by 5870=6·8413 force for every pound of its weight. If the body weighs 100 lbs., the centrifugal force, or the tension on the string which holds the body, will be 684·13 lbs.

W. S. P., of Ky., sends a mineral specimen, asking what it is. Answer: The specimen is iron pyrites (bisulphuret of iron). It crystallizes in cubes, often, however, greatly modified, as in this case. When abundant, it is a source of sulphur and of copperas.

S. C. H. says:—I send you a small specimen of mineral. Will you tell me what this rock contains, and what is its name? Answer: The mineral is iron pyrites in a calcareous rock.

G. B. L., writing from Bridgeport, Conn., says:—Enclosed I send you a stereoscopic view of a fungus found, a few days since, growing upon an old anvil block in an unused blacksmith shop. It was of a pure white color, and about nine inches in extreme length, seven wide, and five high. The finder, considering it a thing of beauty and of a perishable nature, concluded to have a photograph made of it, and knowing that you took an interest in the beautiful works of Nature, I thought I would send you a copy. It had more the appearance of a piece of marble sculpture than of vegetable origin, and was much admired by all who saw it; and parties here have endeavored to preserve it in alcohol or naphtha, but it has lost its beautiful white color and turned yellowish or faded. I have seen many fungus growths upon wood, but never saw anything as beautiful in form as the enclosed copy. Answer: The photograph is excellent, and we are much obliged therefor. It represents the *Hydnum coralloides*, one of the most beautiful of hymenomycetous fungi. For the preservation of fungi, the following mixture has been recommended:—Sulphuric acid, two pints, water, 8 pints; mix and add creosote, 1 pint. Bottle the fungi in this and cork tightly. It is said to preserve them perfectly, without change of color. Fungi may be preserved by drying by bedding them in silver sand, gills upward, in tin boxes, and placing them in a slow oven for two or three hours.

DEW POINT.—What is the formula for calculating the dew point from the data of the hygrometer?—C. A. DeS. Answer: To calculate correctly, a condensation hygrometer must be used; the hygroscope (wrongly called hygrometer), of De Saussure, and similar instruments do not indicate the quantity of moisture. The dew point is the number of degrees by which the temperature must be lowered to induce a deposit of the atmospheric moisture. Daniell's and Regnault's instruments are specially constructed for this purpose; and there is a third, invented by Professor Connell, of Scotland, which also shows the dew point.

A. B. McC., of Mich., asks whether he can make steam easier with water in his boiler up above the third gage cock than with "steam and water" at the lower cock. Answer: We presume that he is using one of the ordinary forms of boiler, and, if that is the case, he will probably keep steam easier, but with less safety, with the lesser quantity of water, as he will be likely to work drier steam. With a boiler which superheats its steam, there might be a possibility that three gages of water would cause the more rapid generation of steam and greater efficiency. The result would also depend somewhat upon the way in which the boilers are set. We should not advise him to secure economy by the sacrifice of security. Our correspondent also has trouble with his draft when the wind blows from the eastward. This may be caused by neighboring buildings, trees or elevated land, or it may be that an east wind in that locality is usually damp and accompanied by a fall of the barometric column. We have no means of judging which. Increased hight of chimney will probably remedy this evil, whatever its cause.

EXTRACTION OF SILVER.—To J. H. P., query 1, page 217.—Mix your refuse with an equal quantity of wood charcoal, place in a crucible and submit to a bright red heat. A silver button will be found at the bottom.—E. H. H., of Mass.

BLEACHING SHELLAC.—To L. Q. B., query 2, page 217.—Purchase bleached shellac at an apothecary's or paint shop. Small quantities are troublesome for an amateur to bleach.—E. H. H., of Mass.

DISSOLVING SHELLAC.—L. Q. B., query 3, page 217.—Shellac may be dissolved in either a strong solution of borax, or a solution of ammonia.—E. H. H., of Mass.

DISSOLVING GLASS.—To D. R., query 14, page 217.—Dissolve glass in a concentrated solution of caustic soda by submitting it to a pressure of from 30 to 50 pounds per inch. When used, it may retain a certain amount of gloss, but will be acted on by a damp atmosphere or water.—E. H. H., of Mass.

CEMENTING WOOD TO GLASS.—To W. R., Jr., query 3, page 234.—Cement your wood first with two or three coats of isinglass in acetic acid, then the surface of the glass; press the two together, and allow to dry.—E. H. H., of Mass.

ELECTRIC LIGHT.—To F. D., query 5, page 234.—Use 6 half pint cells of Bunsen's battery, and attach carbon electrodes to the terminals of your wires; approximate the electrodes, and you will have a fine beam of light.—E. H. H., of Mass.

MOTHS IN FURS OR WOOLENS.—Persons do not need cedar or camphor to keep out moths. Let them sew their furs or other articles up in linen when they put them away, and moths will not trouble them. I have done this every spring and have never yet been troubled with moths.—T. E. L.

ELECTRO-MAGNETISM.—N. B. D. says: I am constructing an electro-magnet, and wish to know whether my magnets will have greater attractive power if the cores be made long and small, or short and thick? Answer: An electro-magnet having short and thick poles will have a greater attractive force than a magnet with long and slender poles, other conditions being equal.—What would be about the right diameter for cores three inches long? Answer: It depends on the intended use. A diameter of three quarters of an inch may suit you.—Would the portable battery, described by Professor Rains in No. 13 of your current volume, generate sufficient electricity to make a very powerful magnet? Answer: We have not tried this battery.

Communications Received.

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

On the Temperature of the Moon.—By J. H. R.

On the Kinds of Lightning.—By W. A. A.

On the Rotation of the Earth.—By H. B.

On Science and Theology.—By J. F.

On the Philosophy of Light.—By E. S. G.

On the True Solution of the Least Square, with Sundry Chemical, Optical and Meteorogical Suggestions.—By J. K.

On A New Theory of Electricity and its Influence on Planetary Motion, Aurora, Needle, Meteorites, Comets, etc.—By H. H. P.

On Car Coupling Dangers.—By C. E. D.

Perpetual Motion Made Possible.—By R. C.

On A New Geometrical Problem.—By J. S. E.

On the Transmission of Motion.—By J. W.

On A New Method of Propelling Canal Boats.—By C. B. M.

On the Cold Water Engine.—By E. L.

On the Rotation of the Earth.—By A. W. L.

On Mr. Coleman Sellers' Illustrations of Plate Coupling.—By J. G.

Recent American and Foreign Patents.

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

CHURN.—William P. Messick and Harvey T. Messick, Clarksville, Texas.—This invention relates to a new churn mechanism whose parts can be easily taken apart or put together, and which operate in conjunction to rapidly reduce the milk to butter. The invention consists in constructing the dasher in two parts, which rotate in opposite directions, and in supplying to their shafts upper detachable ends hung in a slide to be conveniently thrown into and out of gear.

SPRING MOTIVE POWER.—John B. Howell, Wilkesbarre, Pa.—This invention consists of a series of coiled springs and cases or drums therefor, arranged side by side on a shaft and combined together and with the winding up mechanism and transmitting mechanism in such manner as to constitute in effect one spring of great length but in separate coils, which gives much better results in practice than a single spring, of the same length in a single coil, for driving light machinery.

BAG TIE.—John Bowers, Brookville, Ill.—This invention consists of a small rectangular piece of thick leather, or any equivalent stiff flexible substance, with an eyelet near one end and a slit, which is fastened to the bag by one end of a cord long enough to wind several times around the sack and around the coils of itself, between the leather and the sack, and then introduced to the eyelet through the slit, where it is held fast by the knot in the end.

ICE CREAM FREEZER.—Edwin Halloway, Belvidere, Ill.—This invention relates to the class of freezers wherein the revolving cream holder has a rotary stirrer or dasher within it, and is arranged in an ice holder placed in a wooden tub. The ice holder has small holes in the bottom near the center, to allow a draft of cold air contained in the tub to circulate up through the ice, which greatly facilitates the freezing.

SASH HOLDER.—Henry W. Stephenson, Jr., Cincinnati, Ohio.—This invention has for its object to furnish an improved sash lock, locking the sash into any position into which it may be raised; and it consists in the construction and combination of a weighted lever, the middle part of the outer end of which is cut away, and the arms thus formed are bent to one side at right angles, thus forming a space in the forward end of the lever through which a ball or block, made of rubber or other suitable material, may protrude to come in contact with the side of the casing or frame. To the lever is attached an inclined plate which takes hold upon the ball or block. The inner end of the lever is weighted so as, when left free, to always hold the ball or block in contact with the face of the casing. By this construction, when the sash is released after being raised, the friction of the ball or block against the casing will force the said ball or block upward into the narrower part of the space between the said casing and the inclined plate, securely holding the sash. When it is desired to lower the sash the inner or weighted end of the lever may be raised, lowering its outer end and withdrawing the ball or block from the casing. A bolt locks the sash in place.

COMPOUND FOR DESTROYING WORMS AND INSECTS ON TREES, ETC.—Zeno Fen de Moss, Pleasanton, Kansas.—The object of this invention is to furnish a compound to prevent the depredations of the worms and insects which prey upon fruit and other trees, especially the worm known as the "borer," and it consists in strong lye from potash, soft soap, petroleum, and kerosene.

HAY AND STRAW STACKING APPARATUS.—Daniel W. Baird, Lebanon, Tenn.—This invention relates to a new apparatus for elevating and depositing at a suitable place hay, straw, or other material; and consists in a new windlass mechanism for swinging the hoisting beam on its pivot, which is done by means of a sliding carriage on the upright, and by a brace extending therefrom to the beam.

STREET GUTTER.—Hugh O. Ames, New Orleans, La.—This invention consists in the construction of curbs and gutters for streets of cement in molds of the form required, the said cement being rammed hard in the molds, which may either be constructed of boards or plank in two parts, representing the upper and lower sides of the gutter and curb, or the earth bed of the street may constitute the lower side of the mold, while the upper side will be formed of a half mold of planks. The curb and gutter will be formed together in one structure, or each may be formed separately. When the curb is high, buttresses of metal or stone may be arranged behind in the earth bed for strengthening it, and the gutter and curb or either may be strengthened by one or more metal rods incorporated with the cement when being packed in the mold.

GRIPING BLOCK FOR PRESSES.—George W. Swinebroad, Bolivar, Tenn.—This invention consists of steel bars, combined with the inner walls of the griping blocks in presses and other machines, for griping hold of straight bars passing through them by tilting on said bars, so as to gripe and hold for working said bars short stages at a time by levers, the said steel bars being used in the parts most subject to wear to resist the same, and because of the superior capacity of steel to gripe the bars and retain its hold; also, because they can be removed when worn out and new pieces put in.

BOOT AND SHOE CLEANER.—John Malarkey, New York city.—This invention has for its object to furnish a simple and convenient device for cleaning boots and shoes from dust, mud, etc., and it consists in a scraper for removing mud or dirt, and also a kind of box formed with bottom, sides, and top. These portions are covered with bristles, and are so arranged as to clean various parts of the shoe at once.

SMOKE CONDUCTOR FOR LOCOMOTIVES.—Alfred Storm. Matteawan, N. Y.—This invention has for its object to furnish an improved device for conducting the smoke to and discharging it at the rear end of the train, and self adjusting to the various positions that the cars may take with respect to each other in passing around curves, etc. In the rear side of the smoke stack of the locomotive is secured the end of a pipe, the other end of which terminates at the rear end of the locomotive. To the top of each car of the train is attached a similar pipe. The pipes are all stationary, and their ends are all at the same level, so as to coincide with each other when the cars are run together. Upon the ends of the pipes are fitted sleeves which are held outward by coiled or equivalent springs placed upon guide pins, which pass through lugs attached to said pipes and sleeves, and against which lugs the ends of the said springs rest. The outer ends of the sleeves are made bell shaped and are flanged, which ends abut against each other, and are held in contact as the cars play upon their couplings by the springs. A flanged ring cap receives the adjacent ends of the sleeves to cover the openings formed between them when the train passes around a curve, and thus prevent the escape of smoke through said openings.

CLOTH RACK.—Alexander W. Voegtly, Hannibal, Ohio.—This invention relates to a new rack, for use in stores or warehouses, for the support of rolls or pieces of cloth for display. The invention consists in the use of a standing frame, having horizontal arms, which form the supports for the cloth. The inconvenience which is now experienced by merchants in taking goods from the lower parts of large piles is overcome by this invention, as any piece of goods can be taken off any part of the stand without disturbing the balance, and is easily replaced. The frame may, if desired, be made high enough to stand on the floor, and provided with casters so it may be rolled from one place to another.

PLOW.—Willis H. Smiley, of Bentonville, Ark.—This invention has for its object to furnish an improved subsoil plow, which may be attached to any ordinary plow, whether used for preparing land to receive the seed, or for cultivating crops, and which shall be so constructed that it may be readily adjusted to work deeper or shallower in the ground, as may be required; and it consists in the subsoil plow, made with a point at each end, so that when one point becomes dull the plow may be detached and reversed, so that the plow need be sent to the shop to be sharpened only one half as often as a single point plow. It is adapted to be attached between the handles and alongside the beam of an ordinary turn plow.

BEE HIVE.—George F. Hixson, of Gallipolis, O.—This invention comprises a peculiar construction and arrangement of the strips composing two of the sides of the hive with a view to facilitating opening of the case to examine the condition of the bees and comb, and to obviating the necessity for the use of other or separate means for preserving the proper spaces between the comb frames. It also consists of a peculiar construction of the hive to adapt it for utilizing the animal heat of the bees for warming the honey boxes.

WASHING MACHINE.—John H. Doyle, of Williamsburg, O.—This invention has for its object to furnish an improved washing machine, and it consists in a rectangular box supported upon legs or an ordinary round wash tub, as may be desired. Two parallel bars are pivoted at one end to the sides of the tub to keep them from sliding about. Rollers, any desired number of which may be used, revolve in holes in the inner sides of the bars. The bars and rollers form the bed upon which the clothes are rubbed. The rubbing board, the lower surface of which is so arranged as to enable the operator to apply any desired pressure to the clothes while rubbing them, or to conveniently raise the rubber from the clothes when desired.

EGG BEATER.—William O. Crocker, of Laconia, N. H.—This invention has for its object to furnish an improved device for beating eggs, butter, etc., churning small quantities of cream, and for other similar purposes, and it consists in an outer beater formed of sheet metal, and having its sides flared in opposite directions, in combination with the inner beater, the same being connected with mechanism, so as to be driven in reverse directions; also the combination, with the beater, of a downwardly extended arm, provided with a notch, as specified, whereby said beater may be supported on the edge of the dish containing the material to be operated on.

GRATE BAR.—Philip Umholtz and Augustus Umholtz, of Tremont, Pa.—This invention has for its object to furnish an improved grate bar, so constructed that its parts may expand freely in all directions without breaking or straining said parts, and without interfering with each other.

SAW MILL.—Morgan A. McAfee, of Talbotton, Ga.—This invention consists of the application to saw mills of a "liner," by which to gage the stuff to be sawn in adjusting it on the blocks in advance of the saw, and show to the operator when the stuff is in the right position to have the desired amount slabbed or edged off, the said liner being a line or cord stretched, in advance of the saw in its plane, on levers or other devices, by which it can be readily let down close to the stuff to be gaged by it or raised up out of the way.

BEE HIVE.—Frederick Grabbe, of North Topeka, Kan.—This invention relates to a bee hive so constructed that the fixed support for the same forms two of its sides, while the other sides are made removable to permit easy access to the interior, the hive being set in an inclined position.

BASIN COCK.—Alfred Crossley, of Philadelphia, Penn.—In this invention a T headed valve piece on the lower end of the nozzle pipe, working horizontally in a chamber below the stuffing box, and closing at each end against an eccentric seat, through one of which the water enters from below, has an escape passage leading to the nozzle through the side instead of at one end, acting on the seat, through which the water enters, as heretofore, so that the valve is turned away from the seats to open the passages instead of being closed upon it, and so that the water first enters the space in which the valve turns, and then passes through it to the nozzle, thereby allowing of opening and closing the valve with a shorter movement, and saving in wear upon it.

STOVE PIPE DAMPER.—Robert R. Ball, of West Meriden, Conn.—This invention relates to a new and useful improvement in dampers for stove-pipes and other purposes, and consists in the construction of the rod or spindle of the damper and the parts connected therewith, especially in a tapering washer and screw nut, and in a non-conducting material at the knob end of the spindle. By this arrangement the damper may be adjusted without danger of burning the fingers, and will be held securely in any desired position. The friction is entirely on the edge and not on the sides of the pipe. The pipe is not, therefore, compressed between collars, but produces friction where it will be uniform and readily overcome.

SPRING BED BOTTOM.—William D. Mason, of New York city, and Cornelius H. Jacobus and Robert Millen, of Newark, N. J.—This invention has for its object to furnish an improved spring bed bottom. Two longitudinal bars or stretchers are placed near the side boards of the bedstead. To the ends of the stretchers are secured eyes, to receive the hooks formed upon the ends of the coiled wire springs, the hooks formed upon the other ends of said springs being hooked upon hooks or eyes attached to the end boards of the bedstead, each stretcher being thus entirely independent of the other. Two cross bars are placed in such positions as to properly balance the weight upon the bed, and they are notched to the stretchers to keep them securely in place. Upon the cross bars, at suitable distances apart, are placed elastic longitudinal slats, said slats resting in notches formed to receive them in the cross bars. The slats are kept from getting out of place longitudinally by stop pins.

BEE HIVE.—Don J. Arnold, of Brownville, Neb.—This invention relates to a new construction of bee hive, whereby the frames are secured in their appropriate places when the hive is shut, but liberated to be easily removed when the hive is open, and whereby the surplus honey boxes are held confined to the lid when the same is opened, and are not necessarily exposed. The invention consists, first, in applying wedges or inclined blocks to the lid of the hive for holding the frames together while the lid is closed. The invention also consists in such a combination of the upper hood or cover with the lid of the homestead and with the surplus honey boxes that the latter will be confined in the hood, which they fit exactly while the lid is opened.

MOTOR.—Charles J. Schumacher, of Portland, Maine.—This invention relates to an apparatus for storing up power for driving sewing machines and other light machinery. It consists in a series of spiral springs arranged on stationary spindles and revolved by means of gearing and crank, ingeniously constructed and arranged to accomplish the desired object.

MACHINE FOR MAKING BOXES FOR ELEVATORS.—William L. Young, of Marthasville, Mo.—This invention consists of certain arrangements of apparatus in one machine, whereby the workman can perform all the special operations required to make conveyer-flights by power machinery, and govern each particular operation by a standard gage, so that the flight will be much more uniform in respect of the dimensions and finished better than when done by hand, besides being made very much cheaper.

GUN LOCKS.—John J. Byers, of Delta, N. Y.—The invention consists in the relative arrangement of the hammer and the trigger with their respective springs so as to lessen the aggregate space required for them and improve the outside form of fire arm without sacrificing convenience of location in the stock. The stock is recessed, to receive the hammer and trigger, a projecting lip being above the hammer for guarding it. The stock has a perforation through it, whereby the trigger can be reached. The lower part of the stock, under the perforation, is arched like an ordinary trigger guard, but made hollow to receive the hammer spring. When the hammer is drawn back, a tooth of the trigger snaps into a notch on the hammer and holds the hammer cocked. This invention will be found fully illustrated and described on page 262 of the present volume of the SCIENTIFIC AMERICAN.

PLOW.—Francis P. Brannan, of Richmond, Va.—This invention has for its object to furnish an improved plow. The body of the plow is cast solid with the standard or bolted to said standard. The throat of the plow is formed by curving the standard back from the colter of the plow, so that rubbish from the furrow slice or land cannot collect in the throat, and thus clog or choke the plow. In the case of a cast beam, the rear end of the said beam and the forward end of the standard are made with circular offsets to fit upon each other, and through the centers of which passes the bolt by which the said standard and beam are secured to each other. The beam and standard are further secured to each other by a second bolt, upon which is placed a polygonal washer, the flat faces of which rest upon the straight flange formed upon the standard for that purpose, so that by adjusting a face of the eccentric nearer to or further from the bolt to rest upon the flange, and tightening the nuts of the bolts, the plow will be adjusted to work deeper or shallower in the ground as may be desired.

WASHING MACHINE.—John Barnes, of Spartanburg, Ind., assignor to himself and J. W. Locke, of same place.—This invention has for its object to furnish an improved washing machine. The working chamber of the machine is made into a circular form by bars or rounds, placed in the