

measures for gentlemen's coats, and consists in the use of an adjustable quadrangular frame, composed of metal bars, upon each of which a graduating scale is marked. This frame, when laid around the arm of the person whose measurement is to be taken, can be adjusted to give the exact width of the arm, and the distance from the shoulder to the armpit.

**SADIRON.**—James Gray, Newark, N. J.—This invention relates to a new self-heating sadiron, which is so arranged that the cover of the iron will remain cool, and so that the draft can at all times be regulated at will. It consists in the use of a perforated body fixed stationary in the lower part of the hollow sadiron, its interior communicating with the outside air by a hole in the side of the iron; the hole being arranged high enough to prevent the falling out of ashes.

**POCKET COOKING STOVE.**—Joseph Smallwood, St. Johns, N. B.—This invention relates to improvements in portable stoves for workmen and others, whereby they are enabled to heat their coffee or tea, and warm their dinners, when laboring in the field or wood.

**INNER SOLES FOR BOOTS AND SHOES.**—R. A. Webster, Sandisfield, Mass.—This invention relates to a new and useful improvement in soles for boots and shoes, whereby such boots and shoes are rendered impervious to water, and soft and pleasant to the wearer.

**HOT AIR CHAMBER.**—Wm. H. Lee and Charles M. Hardenburgh, Minneapolis, Minn.—This invention relates to a method of constructing hot air chambers, to be combined with air-heating furnaces, for heating public buildings and private dwellings by heated air.

**CARBURETING AIR.**—Henry C. Appleby, Conneaut, Ohio.—This invention relates to a new and useful improvement in an apparatus for carbureting or charging atmospheric air with the vapor of hydrocarbon liquids, for illuminating purposes.

**CONVERTIBLE LOUNGE.**—Lewis H. Baker, Tarrytown, N. Y.—This invention relates to the construction of lounges or sofas whereby they are made to serve various purposes, and are made much more convenient as an article of household furniture than the ordinary kind.

**ORGAN.**—Isaac Roush and J. W. Truby, Otto, N. Y.—This invention particularly relates to a connection and arrangement of parts, whereby the stops can be operated without requiring the use of the hands, and enables all double levers to be dispensed with.

**TABLE CUTLERY.**—R. H. Fisher, West Meriden, Conn.—This invention consists in the use of a bifurcated or split tang, which is formed at the end of the blade, in such a manner that the outer edges of the two tines or prongs will be flush with the edges of the handle. The ends of the prongs are bent in so as to have a firm hold in the wooden or other handle. The bolster is fitted into recesses formed in the edges of the tang, so as also to be flush with the edges of the handle and tangs.

**SAFETY GUARD FOR MINING SHAFTS.**—E. O. Leermo, Gold Hill, Nevada.—This invention consists in the arrangement in a transverse, dovetail groove in the rail, a short distance from the mouth of the shaft of a sliding bar, the upper surface of which projects above the top of the rail sufficiently to block the wheel of a car when it is moved in the right position, which sliding bar is caused to slide in front of the wheels of the car, to block it by the action of a spring when the cage is not ready to secure the car, and which is drawn away from before the said car wheel by the action of a lever, which is actuated by the cage when the latter is moved into the right position to receive the car, whereby the car is allowed to run on to the said cage.

**THREAD CUTTER.**—C. A. Woodbury, Woodstock, Vt.—This invention consists of a circular cutter of somewhat larger diameter than the spool having a central hole and provided with a shield of larger diameter than itself, having notches in the edge forming rounded points or teeth. Near the center the shield is provided with springs projecting therefrom in an axial direction. The shield is attached to the cutter by inserting the springs in the eye of the cutter and bending the pointed projection of the edge over the edge of the cutter, which when so constructed is attached to the spool and held thereto by inserting the springs in the axial hole of the spool.

**CULINARY DEVICE.**—Clayton Denn, Frankford, Pa.—This invention consists of a gridiron provided with a flange projecting downward from the bottom for sitting into the stove hole, also an upward projecting rim and a hollow handle so inclined with reference to the grate as to admit the gray to flow therefrom into the handle. It also consists of a cover provided for the said gridiron with a rim to fit over the rim of the latter hollow handle which serves as a cover to that of the gridiron, and flanges projecting upward from the top whereby it may be used separately from the gridiron to serve as a cake griddle by turning it bottom side up and setting the said flange in the stove hole. An opening is provided through the rim of the gridiron in the direction of the handle, whereby a wire gridiron also having a handle may be set within the above described device, when it is desired to cook oysters, or other small things which would fall through the bars or grates.

**CONNECTING LEAD PIPES.**—Isaac Davis, Brooklyn, N. Y.—This invention relates to a new method of connecting the ends of lead pipes, without soldering, so that they can be easily secured together and easily taken apart.

Answers to Correspondents.

**CORRESPONDENTS** who expect to receive answers to their letters must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

**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 should be by volume and page.

**Ezekiel Moores, Mount Vernon, Ill.**—Twenty dollars received without services.—What is it for?

**U. S. of Mich., asks,** "How much lead is it advisable to give an engine 14 inch cylinder by 50 inch stroke making 54 revolutions per minute and cutting off at seven-eighths? 2d, How much cord wood ought such an engine to burn in a day running 22 hours and generating 23 actual horse power, the wood being mixed, hard and soft, half seasoned? 3d, Can you give me a rule for setting the axles ordinary wagons with regard to the set and "gather," and other points necessary for wheelrights? As for the lead of your engine we can give no positive answer without knowing the style of your valves. If the exhaust can be controlled independent of the inlet, close the exhaust at nine tenths the stroke of the piston and you will not require any steam lead; the "cushioning" of the steam will answer the same purpose. If you cannot cushion on the exhaust, set your valves so they will be just perceptibly open when the engine is on the center. 2d, If your engine is in order, cutting off at seven-eighths of the stroke, it would require about 6 lbs. of anthracite coal per hour for each indicated horse power. A cord of well seasoned hard wood is reckoned as about equal to half a ton of anthracite; one pound of the first being calculated to raise 5,000 lbs. of water to one degree of heat and the same amount of anthracite 9,560 lbs. 3d, See page 217, vol. XV, SCIENTIFIC AMERICAN.

**E. B., of Mass., asks** if some of our correspondents will give the reason of the long continued sound of thunder. "Distance, reverberation, echo, etc., are referred to as the reason. Do they sufficiently explain the phenomenon?"

**C. L. A., of D. C., asks,** "Is there any practical objection to the construction of a railroad on the following plan: Track 8 feet wide between rails; wheels 12 feet diameter, of wood and iron combined; curves never less than the radius of a mile? In running 100 miles car wheels of 3 feet diameter make about 58,666 revolutions, while those of 12 feet diameter would make only about 14,666 revolutions. It appears to me that ease of draft and movement and greater speed, with less strain on the wheels, would be attained. Is there any reason why railroad companies, at home and abroad, have adhered to small wheels and narrow gage?" It is a notable fact that wide gage roads—6 feet—as compared with the narrow gage—4 feet 8 inches—have in this country proved unprofitable. The excessive

weight of the rolling stock, its greatly enhanced first cost, the additional expense of the road bed, etc., have more than counterbalanced the increased capacity for freight—there is no increased carrying capacity for passengers. Wheels of 12 feet diameter could not be as cheaply or strongly made as those of less diameter, and the combination of wood and iron would hardly receive the approval of sensible engineers, except as wood is employed in the Griggs' patent to hold locomotive tires in place.

**T. C. M., of Wis.**—The weight of water being 1, that of cast iron is 7.2, and of lead, 11.3. For further information as to the relative weight of different substances we refer you to any manual on mechanics or treatise on natural philosophy.

**J. R., of Pa.**—The information on petroleum you desire, can only be obtained in the petroleum regions, from those who make it a business to bore wells, and strike oil when they can. Very little has been published on the subject, it being entirely new.

**R. S., of R. I.**—There is no danger whatever of coal or wood ashes taking fire by spontaneous combustion, after they are once cold and thoroughly extinguished; only do not pour linseed oil or another similar substance on them.

**J. D., H.**—1st, Mica can be bought in pretty large slabs, say one foot square, without cracks; however it is never as uniform as glass. 2d, There is no other transparent substance known impervious to water and fire-proof. 3d, You can bend it to any shape, like cardboard, provided thin plates are used, as they are very elastic, but their rigidity increases with their thickness.

**J. B. F., of R. I.**—There is no difference in the useful effect of a suction or lifting pump of the same size when the same amount of water is attempted to be raised to the same height by the same power employed only in the lifting pump the lower position of the piston, necessitates longer rods, more weight to carry, and more exertion to overcome. In this respect the suction pump may sometimes have a slight advantage.

**J. P., of Pa.**—Iron bolts may be cleaned from grease, by moistening them with benzine, and rolling them in dry sawdust; afterward brushing.

**J. D., Idaho Ter.,** wants a simple method to treat sulphurets in the raw and unworked state by the wet process, in quantities of at least 500 lb. This is exactly the result that thousands of metallurgists are at present seeking after, but so far without success.

**J. A. W.**—Condense your ideas on boiler explosions. We have not room to publish so much.

**B. K., of Pa.**—The plan of using compressed air as a generator of power is one of the usual hobbies of men of limited information; it must be remembered that compressed air acts like a spring wound up, never can more force be got out of it, than is put in.

**E. R., of Wisconsin,** is a new inventor of perpetual motion. He proposes to use compressed air for working an engine which moves an air pump, and thereby keep up the full pressure of air in the vessel, which again works the engine, several other engines besides, and so on; he says if he "were blessed with a large share of this world's goods" he would "develop the idea, though it might cost thousands of dollars." We think it fortunate for our correspondent that he has no money to waste.

**R. H. D., of Pa.**—Matches without sulphur or phosphorus are made of three parts chlorate of potash, three of ground glass and three of bichromate of potash, two of Dextrine or gum and eight parts water; There are several receipts more or less reliable, the simplest is perhaps chlorate of potash two parts, gum arabic three parts, and soot one part.

**T. W., of Vt.**—Without having a sample of the deposit on your pans to analyze, we cannot tell what will dissolve it; if it is a compound of lime, hydrochloric acid is the most ready solvent.

**E., of M.**—A round flue having less interior surface in proportion to the area of its section, gives less resistance to draft. When the flue is wide enough, the form is not as essential as the smoothness of the interior surface. A rough flue gives much more obstruction to draft, than is generally supposed, specially when flat or narrow. When wide enough to give exit to all air and smoke, and long enough to insure the steady and powerful ascent of the heated gases, there is nothing gained by widening it at the top, except when the lower part is too narrow, then a widening at the top may compensate for this to a certain degree.

**G. W. B., of Va.**—Curiosities of the kind you mention are not very salable, in fact of little value except to some amateur whose fancy induces him to buy.

**J. R. C., of Iowa.**—You cannot compare the effect of the pressure of a body in rest, with that when in motion; it is the old problem of the *vis viva* revived. Your hammer of 1400 lbs. falling 30 feet, has an effect which cannot be compared by single pressure; after a certain theory it would be equal to 1,260,000 lb. falling 1 foot or nearly 200,000,000 pound falling 1 inch, but the effects are so much influenced by the relative weight of hammers, piles, nature of soil, etc., that no general rule can possibly be arrived at. Imagine only a very small weight driven by great velocity on a heavy mass; it will of course not move it, but its effect will be only confined to the locality of contact. You may find further explanations in any good book on Dynamics.

**J. B. W., of Washington.**—Your well written communications are not adapted for our paper, being too speculative. Articles to be accepted must be on practical subjects and condensed as much as possible. You rightly attack old dogmism in science, but our advice is to study the modern doctrine of the correlation of forces. For instance in Tyndall's recent work "Heat considered as a mode of motion," you will find an essay on the subject you treat, Cosmogony, and will discover that combustion and chemical action generate only a very small amount of the heat distributed in the universe; they are not the primary producers of heat, but a deeper cause is at the bottom of all these and other phenomena of caloric action. The above mentioned or other recent works of Mayer, Joule, Helmholtz, Grove, etc., explain all this in detail.

EXTENSION NOTICES.

William Thornley, of Philadelphia, Pa., having petitioned for the extension of a patent granted to him the 19th day of September, 1854, for an improvement in safety washers for securing wheels to axles, for seven years from the expiration of said patent, which takes place on the 19th day of September, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 31st day of August next.

Abner Whiteley, formerly of Springfield, Ohio, now of Platte County, Mo., having petitioned for the extension of a patent granted to him the 19th day of September, 1854, for an improvement in grain and grass harvesters, for seven years from the expiration of said patent, which takes place on the 19th day of September, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 31st day of August next.

Harry H. Evarts, of Chicago, Ill., having petitioned for the extension of a patent granted to himself and A. J. Brown as assignees, the 31st day of October, 1854, for an improvement in shingle machines, for seven years from the expiration of said patent, which takes place on the 31st day of October, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 19th day of October next.

Stephen J. Gold, Cornwall, Conn., having petitioned for the extension of a patent granted to him the 3d day of October, 1854, for an improvement in warming houses by steam, for seven years from the expiration of said patent, which takes place on the 3d day of October, 1868, it is ordered that the said petition be heard at the Patent Office on Monday, the 14th day of September next.

Business and Personal.

The charge for insertion under this head is one dollar a line.

Carbonate of Barytes wanted in large quantities. Address A. G. Hunter, Fair Haven, Conn.

If you desire to invest moderate capital safely and profitably, we offer City, County, State, or the entire right in "That Dipper," "The Universal Weighing and Measuring Cup," "The Little Wonder," or "Combination Funnel," (with six distinct uses), and the "Adjustable Dredge." Address Marsh & Co., 33 Maiden Lane, New York, Gen'l Agts for U. S.

Wanted—a six-horse portable engine and boiler. Address, with particulars and price, Edward Park, Poughamton, N. Y.

Wanted—illustrated priced list of all kinds of shingle, stave, barrel, and heading machinery. Address L. T., Valley Forge, Mo.

Brick Machine.—Lafier's New Iron Clad has more advantages than any other ever invented. For descriptive circular address J. A. Lafier & Co., Albion, Orleans county, N. Y.

Adams' improved air cylinder graining machine, in operation daily and specimens of work at 44 Murray st. Send stamp for circular, full particulars, prices, etc. Address Heath, Smith & Co., as above.

The surest detective of low and high water, and high steam in boilers yet invented. Springer, Hess & Co., Philadelphia, Pa.

Bartlett machine and needle depot, 569 Broadway, New York. Needles for all machines, hackle, gill pins, etc.

Merriman's patent bolt cutters—best in use. Address, for circulars, etc., H. B. Brown & Co., New Haven, Conn.

Prang's American chromos for sale at all respectable art stores. Catalogues mailed free by L. Prang & Co., Boston.

For breech-loading shot guns, address C. Parker, Meriden, Ct

Winans' Boiler Powder, for 12 years a positive remedy for incrustations, is so extensively imitated and pirated, by pretended agents, that it is not safe to buy except at 11 Wall st., N. Y.

NEW PUBLICATIONS.

THE BLOWPIPE. Its Practical Use. By G. W. Plympton, A. M. D. Van Nostrand, 192 Broadway, New York.

The object of the compiler of this volume is to present to the beginner in chemical analysis, plain, practical instruction on the use of the blowpipe in the laboratory and workshop, with full directions for its manipulation, descriptions of the best reagents, etc. It is illustrated with cuts and contains valuable tables of the reactions of metallic oxides and metallic acids, with a copious index for reference. It will be found to be advantageous not only to the beginner but to those more advanced in chemical science.

THE AMERICAN CARBON MANUAL.

Photographer: will be glad to know that they can now obtain, in the above work, full and complete directions for producing their prints, without silver, by means of the new carbon process. This method has been so improved and simplified that it may be readily practiced with success by all photographers. The pictures produced by it are very uniform, and any desired tint or shade may be easily imparted. The book before us is from the pen of Edward L. Wilson, the accomplished editor of the Philadelphia Photographer, published by the Scoville Manufacturing Company, 35 Park Row, New York.

THE FAMILY RECORD. Biographic and Photographic. Arranged for recording in detail the personal incidents in the life of each member of the family. By John H. Griscom, M. D., New York.

The author of this record has arranged a very convenient and practical work, which ought to be possessed by every family. The first page is set apart for the names, birth, marriage, etc., of both husband and wife, and also a space for photographs. There is also room for personal incidents, and it contains a register for the different maladies which afflict children. A book of this kind, if well kept, would be invaluable to families, not only for present but for future reference.

NEW YORK CITY DIRECTORY, for the year ending May, 1869. Compiled by H. Wilson. John F. Trow, publisher, 52 Greene street.

The task of collecting the names, business pursuits, and residences of 185,751 citizens, alphabetically arranging the same, and publishing the whole in the space of a few weeks' time, is one the magnitude of which can be known only to those who have attempted similar undertakings, and is only made possible through the perfected system of obtaining information which long experience has taught the publisher of this volume. The yearly growth of the city and the increasing demands of business make us a migratory people, and necessitates the re-compilation of the entire work annually. "The whole city is like a huge kaleidoscope which annually dislocates itself and forms a new figure," and to point out these changes is the province of the "Directory." The number of names this year, as stated above, is 185,751, being an increase of 8,434 over the number contained in the issue for 1867-8.

FOOTPRINTS OF LIFE, OR FAITH AND NATURE RECONCILED. By Philip Harvey, M. D. Published by Samuel R. Wells, 359 Broadway, New York.

This volume embraces a poem of considerable literary merit. It traces the origin of the body through a progressive development to the end of life. It also treats of the soul and of Deity with pious reverence.

A GUIDE TO THE STUDY OF INSECTS, and a Treatise on those Injurious and Beneficial to Crops, for the use of Colleges, Farm Schools, and Agriculturists. By A. S. Packard, Jr., M. D., of Salem, Mass. Part I. Price 50 cents.

This very instructive and excellent pamphlet of 60 pages is copiously illustrated with wood cuts of a great variety of insects, and deserves to be read by all those who are engaged in the culture of the soil.

HALL'S HEALTH TRACTS.

This volume contains an interesting series of practical tracts on health, which have appeared from time to time in Dr. Hall's Journal of Health. The author is a prolific writer, and aims to bring to the reader's attention a sensible way of preserving the health by other means than the quack medicines, which curse our go-ahead countrymen and women more than any other people in the civilized world. The French are probably the healthiest people in Europe. They stay out of doors a good deal of their time, and take little medicine.

Inventions Patented in England by Americans.

(Compiled from the "Journal of the Commissioners of Patents.")

PROVISIONAL PROTECTION FOR SIX MONTHS

- 1,604.—APPARATUS FOR SEWING OR STITCHING SEPARATE PARTS OF A VOLUME.—H. G. Thompson, New York city. May 16, 1868.
- 1,618.—APPARATUS USED IN THE MANUFACTURE OF IRON AND STEEL.—A. L. Holley and J. B. Pearce, Swatara, Pa. May 16, 1868.
- 1,644.—APPARATUS FOR OPENING SARDINE AND OTHER SHEET-METAL CANS, AND CUTTING SHEET METALS, ETC.—Bellina Froehlich, New York city. May 20, 1868.
- 1,661.—POWER LOOM.—E. B. Bigelow, Boston, Mass. May 20, 1868.
- 1,664.—MARKING AND CREASING TUCKS UPON A SEWING MACHINE.—Mary Ann Duffy, New York city. May 20, 1868.
- 1,684.—FRICTIONAL GEARING.—Albin Warth and Eberhard Faber, New York city. May 21, 1868.
- 1,689.—GRATE BAR.—A. C. Fletcher, New York city. May 22, 1868.
- 1,767.—MANUFACTURE OF LEAD PIPE AND LEAD PIPE LINED OR CASED WITH TIN OR OTHER METAL.—Wm. A. Shaw, New York city. May 28, 1868.
- 1,777.—PLATING SPOONS, ETC.—Marshall Forbes, West Meriden, Conn. May 29, 1868.
- 1,803.—PAPER SATINING MACHINE.—Thomas Christy, New York city. June 2, 1868.