

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 logyism 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.

Improvement in Planting Machines.

Devices for diminishing the labor of planting corn and other crops are quite numerous, but not always satisfactory in operation from their complication or their difficulty of management. The accompanying engraving gives views of one of the simplest machines of this class that has come under our notice; cheap, easily managed, and not liable to get out of order.

Fig. 1 is a perspective view of the machine, and Fig. 2 a vertical elevation of the principal working parts. The frame is rectangular, with two guiding handles rising from its rear portion, between which runs a wheel, A, and carrying a hopper, B, which contains the corn or other seed to be dropped. The front part of the machine is sustained by a small wheel, C, the supports of which can be adjusted to the height required by means of set bolts in slotted ears, D. In front of the hopper is a transverse marking bar with a pointer on the end to mark the ground for laying out the next row. This bar and pointer is hinged and adjustable so it can be at once changed to the other side of the machine.

In the bottom of the hopper is a slide, having an aperture through it, which can be adjusted, by an adjustable gage working in the seed slide, to deliver a greater or less number of kernels, or a greater or less amount of seed. The seed slide is actuated intermittently by a curved lever, E, its fulcrum being at F, one end engaging with the seed slide and the other being operated by pins on the side of the wheel, A. This wheel may be of any size required, and the pins may be placed as desired, the distance between the hills of corn be determined by these means. The wheel, A, may be changed quickly for one of a larger or smaller size. A hinged clapper or valve, operated by the lever which moves the seed slide, and by a suitable spring, closes the delivery spout, G, while the machine is passing from one hill to the other and opens it for the delivery of the seed when the spout arrives at the proper spot for placing a hill.

Patent obtained through the Scientific American Patent Agency, May 12, 1868, by Wm. H. Fish, Jr., who may be addressed at Scarsdale, Westchester Co., N. Y.

Improved Device for Opening and Closing Window Blinds.

The annoyance, and even danger, of having to lean out of the window for the purpose of unfastening and closing an open blind, and the necessity of opening the window in the most inclement weather, either for closing or opening, seem to give peculiar value to any device by which this annoyance and danger may be avoided. The plan illustrated in the annexed engraving seems to be effectual in permitting the manipulation of window blinds from the inside of a room without raising the window.

Centrally, in the window sill, is a catch, A, operated by the knob, B, which depresses the catch when pulled, while the catch is returned to place by a common spiral spring. This catch secures the blinds when closed. To the rear bottom portion of each leaf of the blind a bar or lever, C, is attached by a hook engaging with a metal plate recessed into the blind. This bar passes through a recess in the window sill and terminates in a knob inside the room. The bar or lever has slots which engage with the edges of a metallic plate let into the inside face of the window sill, and secures the blind wholly open, or held at any angle desired. Except the central catch, no springs are used, and as all the parts are secured from the weather, no opportunity for injury or disarrangement occurs. The knobs projecting into the room may be made ornamental. The device appears to be well adapted to the purpose designed.

Patented by John Solan, Dec. 18, 1860.

For further particulars address Maj. W. B. Richards, at Hoy, Kennedy & Co.'s, No. 111 Liberty street, New York city, or Geo. W. McGovern, Richmond, Va.

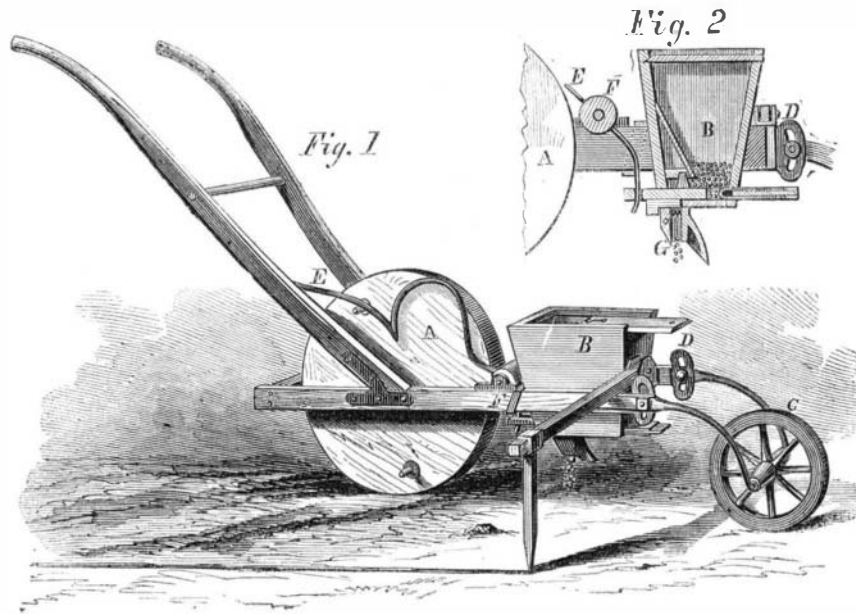
WATER BLOWING THROUGH ENGINE CYLINDERS.

A correspondent mentions some of the facts attendant upon the collapse of a boiler in the foundry of Wood, Frisbie & Co, Newburgh, N. Y., and gives his opinions upon the accident. We give his statements in brief, with some remarks. He says:—

"The boiler was twenty-four feet long, four feet in diameter, with two fifteen-inch flues. I examined the boiler and found the heads bulged out about three inches, as far up as the fire surface. The flues collapsed their entire length, and were broken at each end. The iron was scaled by heat. The upper half of the boiler was as perfect as new. The boiler was set about on a level with the engine, the steam pipe leading to the cylinder somewhat in the form of a siphon. The steam was about thirty-five lbs. pressure, the fires new and of intense heat, and the water known to be at the third gage cock.

"I account for the collapse, that it was caused by a want of water in the boiler, and that the water was instantly drawn

from the boiler without the knowledge of the engineer. I have seen the water issuing from the escape pipe with such velocity as to have emptied the boiler in a very few minutes, and this occurs frequently on high pressure boilers with small steam room. The syphon-like form of the steam pipe, from the boiler to the engine cylinder would tend to draw the water from the boiler when once started. The main difficulty is to ascertain the exact time, and to know the cause of the water flowing out of the boiler, through the cylinder and escape pipe. This generally happens when the water is high in the boiler, with a low pressure of steam, and the steam room occupied by water so as to leave small steam space, not sufficient to supply the cylinder. Most of the explosions happen in



FISH'S PATENT CORN PLANTER.

about one, or one and a half hours after the engine has started, as in this case. In the cases of the explosions of the *Metropolis*, some thirteen years ago, *John J. Roe*, in 1861, the *Princess*, in 1860, the *St. Nicholas*, and the *Sultana*, the water was seen to issue from the escape pipe before the explosion took place."

We agree with our correspondent that this was a case of low water, if, as stated, the flues were so heated as to be scaled. But if the water was "instantly drawn from the boiler," there would seem to be not much opportunity to form heat scales. We have grave doubts about the water escaping through the engine as rapidly as the statement of our correspondent would imply. The heads of the cylinder, the crank, or bed would be broken, or the connections crippled; beside, the pounding of the piston would probably have been heard throughout the foundry. If the water had gone off as stated, there could hardly have been time left to heat the flues sufficiently to scale them. Our opinion is that the supply of wa-

It is hard to say whether some of its features of utility were originally incidental to facility of construction, or whether they were not directly sought after for their own sake. The form of the cask is a truncated, oblate spheroid. The conveniences of this form are the attainment of a base upon which the cask will stand firmly, and, at the same time, perfect facility in movement when it lies upon its side. Theoretically, when in the latter position it rests like a sphere upon a single point. It can then be whirled about upon its vertical axis with the application of a very slight force, or rolled in any direction. We say rolled in any direction—it may be rolled endwise. Of course, the flat ends, or heads, interfere very much with the process, but a cask may nevertheless be rolled longitudinally, with a very much less expenditure of force than a cylinder of the same weight.

In our youthful days, we were very much impressed with the performances of a rustic Sampson, who used to "end up" very heavy casks with one hand, by taking advantage of a rocking motion which he imparted to it, and applying his strength in full force at the moment the cask rested upon a point very near the chime. What then appeared to us wholly a feat of vast strength, we now know to be dependent in a great measure upon the application of sleight.

Another advantage resulting from the spheroidal form of casks, is that they may be rolled easily over uneven surfaces without deviating from the direction of the motion imparted to them, a great convenience in placing them in proper positions upon decks of vessels, or moving them about upon wharves.

Great strength also results from this form, as the force of any external blow is transmitted to, and distributed over all parts of the structure.

A familiar conversation with a friend, in which he claimed that the advantages of the spheroidal form were obtained incidentally, the

probable original design being merely to obtain a form in which the staves could be held together by the hoops, suggested this article. We stated in reply to his views, that the hoops would be retained, and the staves would be held by them as well, if the cask were given the form of the Dutch churn with two heads. It is easy to see, however, how the advantages, which are peculiar to the spheroidal form, would be all lost if the shape of the churn were substituted for it.

On the whole, there are few things that answer their purpose better, or give more evidence of perfection resulting from design, than casks.

A Noble Benefaction.

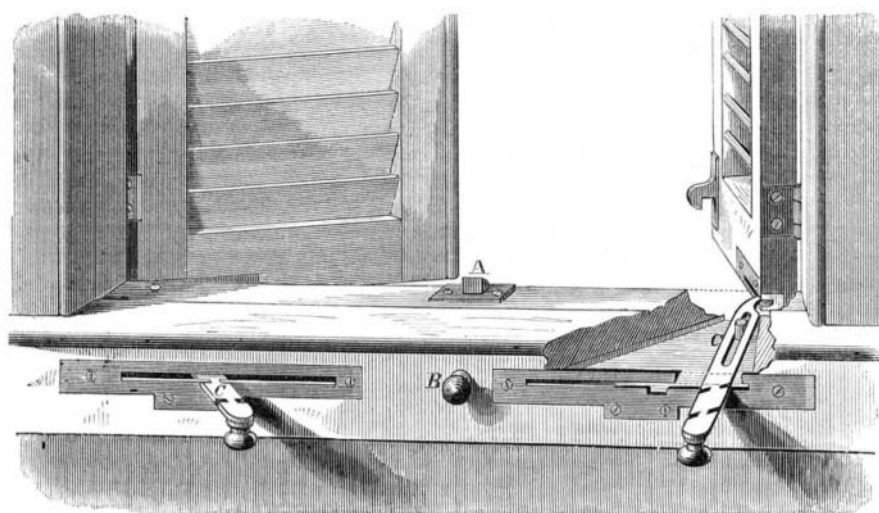
The English papers unite as with one voice in lauding the liberality of one of their most eminent mechanical engineers, who has lately founded thirty scholarships, each of the yearly value of one hundred pounds sterling, these sums to be applied for furnishing as many young men of English birth with advanced instruction in mechanical science and practice. The author of this benefaction is Mr. Joseph Whitworth, whose system of gages is generally accepted as a standard in this and other countries, but whose name is perhaps even better known because of his great attention bestowed of late years upon the construction of ordnance, and his exhaustive experiments on rifled guns and ammunition.

The object in making this princely endowment is to advance the cause of technical education, and the promotion of engineering and mechanical industry in his own country. In competing for these scholarships, proficiency must be shown in the use of one or more of the following classes of tools: the ax, file, saw, and plane; hammer and chisel, and the forge; as also a satisfactory knowledge of the elementary mathematics and mechanics, practical and descriptive geometry, and free hand drawing. By making these requisites, the student, combining some practice with theory,

and the artisan, who combines some theoretical knowledge with perfection of workmanship, start on fairly equal terms.

In carrying out the ideas of Mr. Whitworth, the successful competitors for these prizes may attend universities or colleges affording scientific or technical instruction, or he may travel and study abroad. As the full scholarships can only come into full operation by degrees, the founder proposes to make the fund which will ultimately be available for the scheme to be placed at the absolute disposal of certain towns and educational institutions in order that they may be awarded to youths who desire to be qualified to contest for the scholarships in May, 1869.

BET ROOT SUGAR.—During the last twenty-eight years, the production of the cultivation in France of the sugar beet root has advanced from 22,000 tons to 222,000 tons. The total annual product in European countries amounts to 638,500 tons, and now produces more than one-fourth of all the sugar known to be consumed in the world. Indeed, the success now uniformly achieved on all sides shows that, though the same causes which long retarded the progress of the beet industry in France will more or less obstruct it elsewhere, nevertheless its ultimate triumph is certain in every country where it is introduced with care and cultivated with reasonable patience and skill.



SOLAN'S PATENT BLIND OPENER.

ter by the pump was insufficient to furnish the requisite amount for the generation of steam, and that the scaling was the result of a radical and long continued difficulty of this sort.

A reliable low-water detector and reporter (and there is such in the market) would, in this case, have prevented the collapse, if the flues had been of sufficient strength to resist the boiler pressure.

CASKS.

Casks have been used from a very early period, and the cooper's art is accordingly a very old one. Many improvements in the method of their manufacture have been introduced during the last twenty-five years, such as machines for cutting heads, staves, and bungs, but the cask itself remains in all its essential features the same as it was a century ago. Certainly, anything must have attained to a high degree of perfection, if it could pass unchanged through a century of such development in the mechanical arts as the present has been; still more is it remarkable of a thing so universally used as a cask.

We believe that there is nothing in general use which comes nearer a perfect adaptation to all requirements than the homely and useful article about which we are writing.