

money in oil property, we doubt not that as many men would get rich from this business as from any other, just as many, perhaps, and no more. The great thing that we complain of is, that a lot of relentless speculators heat up the money loving spirit of our people to a consuming fever; thousands are thus allured into the tempting snare, and lose, perhaps, their little all. It is absurd to suppose that the whole community are to be lifted suddenly upon the high places of wealth by these joint stock petroleum well companies.

### THE CORRELATION AND CONSERVATION OF FORCES.

This is a collection in one octavo volume of 438 pages of the treatises on the new philosophy, by Professor Grove, Professor Helmholtz, Dr. Mayer, Dr. Faraday, Professor Liebig, and Dr. Carpenter, collected and arranged with a clear and comprehensive introduction of 32 pages, by Edward Youmans, M. D., and published by D. Appleton & Co., 443 and 445 Broadway, N. Y. Dr. Youmans introduces each of the treatises with a brief biographical sketch of the author. We extract that of Mr. Grove, who claims to be the first who taught the correlation of forces as a connected system.

William Robert Grove, an English lawyer and physicist, was born at Swansea, July 14, 1811. He graduated at Oxford in 1834, and during the next five years was professor of Natural Philosophy at the London Institute. Professor Grove is a rare example of the ability which has achieved a distinguished eminence in different fields of effort. While pursuing with marked success the profession of an advocate, he has devoted his leisure to original scientific researches, and obtained a high distinction both as a discoverer, and a philosophical writer upon scientific subjects. In 1852 he was made Queen's counsel, and afterwards Vice President of the Royal Society. He is the inventor of the powerful galvanic battery known by his name, and his chief researches have been in the field of electricity. Many of his experimental results are referred to in the following pages, which will also attest his high position among the founders of the new philosophy of forces.

We shall give a fuller account of this work when we have examined it more carefully; in the mean time we commend it to our readers, as being a complete exposition, by the greatest intellects, of the Conservation of Force, in its simple grandeur the most sublime idea that the progress of knowledge has evoked from the human mind.

### REDUCING CAST IRON TO STEEL BY CARBONIC ACID.

At the meeting of the Polytechnic Association on Thursday evening, Dec. 22d, Professor Fleury exhibited some specimens of cutlery which had been made by casting the forms in cast iron, and then converting the metal to steel by means of carbonic acid. The carbonic acid is obtained from carbonate of soda, of potash, or of lime. The cast iron articles are packed in an airtight box with the carbonates, and placed in a furnace, where they are subjected to a bright red heat for two days. The carbonic acid, which is set free from the carbonates, is decomposed by the carbon in the iron, giving up one equivalent of oxygen and becoming carbonic oxide, and the oxygen that is set free combines with the carbon of the iron to form also carbonic oxide. The 5 per cent of carbon in the cast iron is thus reduced to the  $\frac{1}{3}$  or  $\frac{1}{4}$  per cent, necessary to form steel. If the operation is still further continued, the remaining carbon is removed, and the metal is reduced to malleable iron.

White charcoal iron is the best for use in this process, but it is found that gray iron is changed to white by the carbonic acid. White iron is formed by the chemical combination of iron and carbon, but in gray iron there is also some free carbon not chemically combined. This free carbon is first removed by the action of the carbonic acid, and the gray iron becomes white.

Professor Fleury further stated that this process does not make metal equal to the best steel, but good enough for hammers, shovels, plows, and agricultural implements generally.



ISSUED FROM THE UNITED STATES PATENT-OFFICE FOR THE WEEK ENDING DECEMBER, 27, 1864.

Reported Officially for the Scientific American.

Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

45,570.—Pamphlet File.—R. M. Abercrombie, Rahway, N. J.:

I claim a case for the filing, marking and indexing of pamphlets and tracts, constructed substantially in the manner described in the foregoing specification and the annexed drawing.

45,571.—Ladies' Work Basket.—Seymour Ainsworth, Saratoga Springs, N. Y.:

I claim a ladies' work basket, constructed substantially as herein described.

45,572.—Safety Fuse.—John H. Andrews, Avon, Conn.:

I claim, first, The inner tube, B, as herein described, and also the coating of the same with rubber or other equivalent material, for the purpose herein set forth.

Second, The substituting of paper or paper parchment in the place of cloth or other material now used in the manufacture of tape fuses, substantially as herein described.

45,573.—Oil Well Pump.—E. H. Ashcroft, Lynn, Mass.:

I claim the tubes, C and C', for the escape of gas from the bottom of oil wells, thereby relieving the over valve box from injurious pressure or opening which prevents the operation of the pump, the same located and operated substantially as described.

45,574.—Lamp Trimmers Shears.—Wm. B. Barnard, Waterbury, Conn.:

I claim constructing improved shears or lamp trimmers, substantially in the manner herein set forth.

45,575.—Apparatus for filling Cigarettes.—Ezechel Berg, New York City:

I claim, first, The employment or use of the packer, B, and hopper, D, constructed and arranged so as to operate substantially in the manner and for the purpose herein specified.

Second, The mold or receptacle, F, constructed substantially in the manner herein shown and described.

45,576.—Twine-cutting Ring.—Theophilus L. Bishop and George K. Hall, Boston, Mass.:

I claim the new or improved twine-cutting ring, made substantially as described, viz: with the beak and the knife or recessed cutter, arranged and combined with the hoop and head of the ring, substantially as specified.

45,577.—Cess-pool.—George T. Bohen, San Francisco, Cal.:

I claim the angular or outwardly inclined walls in combination with the curved or straight partition wall and cast-iron oval plate above, substantially in the manner and for the purpose herein described.

45,578.—Ladies' Felted Skirt.—Almanzor W. Boynton, Norwalk, Conn. Ante-dated Dec. 13, 1864:

I claim, as a new article of manufacture, a whole skirt for ladies of one piece of felting, substantially as herein described and set forth.

45,579.—Machine for molding Sugar for Table Use, etc.—Leander W. Boynton, Hartford, Conn. Ante-dated Dec. 15, 1864:

I claim, first, The main cylinder, with its movable segments containing the cavities or molds, in combination with the rows or bars of plungers, when the whole is constructed, arranged and fitted for use, substantially as herein described.

Second, I claim the main cylinder and its series of plungers in combination with the upper cylinder armed with its series of projections, when they are constructed and fitted to produce the result, substantially as herein described.

Third, I claim the main cylinder and its series of plungers, in combination with the anti-friction rollers and cams when they are constructed, arranged and fitted to operate, substantially as herein described.

Fourth, I claim the combination of the main cylinder and its appendages with the vat and absorbing roller, when arranged and used substantially as herein described.

Fifth, I claim the adjustable cams, s, and ratchet wheels and cords in combination with the hopper when so constructed and arranged as to regulate the quantity of sugar in the molds, substantially as herein described.

Sixth, I claim the hopper, in combination with the spurred rollers, p, when those rollers serve to support the superincumbent weight of the sugar in the hopper so as to prevent unequal pressure on the surface of the main cylinder, as herein described.

45,580.—Sawing Machine.—N. B. Brown, Antwerp, N. Y.:

I claim, first, The arrangement of the saw bar, D, connecting rod, H, crank pulley, C, rock shaft, G, and lever, K, connected with the gear, P, by the cord, c, substantially as and for the purpose herein set forth.

Second, The arrangement of the crank, f, on shaft, B, clutch, M, actuated by the levers, N O, rod, Q, rock shaft, V, arm, R, pawl, T, ratchet, U, and roller, S, all substantially as and for the purpose specified.

Third, In combination with the saw bar, D, and saw, E, I claim the double guide ways, a b, gliding gates, F, J, and roller, I, arranged and employed in the manner and for the purposes specified.

[This invention relates to a new and improved machine for sawing wood transversely with the grain, and is more especially designed for sawing logs into pieces of requisite length for fuel.]

45,581.—Flat Iron-holder.—Frederick W. Brocksiefer, New Britain, Conn. Ante-dated July 10, 1862:

I claim, as a new article of manufacture, viz: a handle or holder made longitudinally in two or more parts, a, and secured together by spring hinge, d, or other mechanical equivalents, to act as a partial non-conductor of heat, substantially in the manner as and for the purpose described.

45,582.—Rock or Ore Crusher.—James Brodie, San Francisco, Cal.:

I claim the eccentric applied direct to the movable jaw when connected with the link, C, thereby giving the crusher an oscillating and eccentric motion.

I also claim the water chambers between the eccentric and the movable jaw, as described.

45,583.—Car Truck.—Nahum F. Bryant, Boston, Mass.:

I claim the combination with a car wheel and an axle upon which said wheel slides, of flanges or projections, e, f, which control the extent of lateral movement of the slide wheel, and a device or devices placed on one or both sides of the hub for confining the wheel against the flange, e or f, and between said flange and the looking

device, in the manner and for the purpose substantially as set forth. I also claim the removable cylindrical collar to be placed between the hub and the flange, e or f, on either side of the wheel, substantially as described.

Also the manner of securing the collar in position upon the axle by means of the ring.

Also the springs which keep the ring from lateral movement. I also claim in combination with a sliding wheel, the spline in the hub thereof, and the groove, in the axle, operating together to guide the wheel in its lateral movement, and to prevent its rotation on the axle, substantially as specified.

45,584.—Apparatus for making Extracts from Animal and Vegetable Substances.—John Chilcott, Brooklyn, N. Y. Ante-dated Dec. 20, 1864:

I claim the combination within the steaming vessels or digester, A, of the series of open perforated or grated shelves, B, and the baskets, C, C', for containing the matters to be heated, arranged upon the said shelves, substantially as and for the purpose herein specified.

45,585.—Machine for forming Baskets.—Thomas and Jehiel Churchill, Detroit, Mich.:

We claim the form or block placed on a horizontal shaft so as to rotate freely, and provided with any suitable fastening or fastenings for securing the splints and bottom to the form or block, substantially as and for the purpose herein specified.

[This invention consists in the employment or use of a form or block, made in the shape corresponding to that designed for the basket, said form or block being fitted on a shaft or mandrel so that it may turn freely, and all so arranged that the splints may be interwoven together on the form or block with the greatest facility.]

45,586.—Elastic Breech for Ordnance.—John F. Cleu, New York City. Ante-dated Dec. 22, 1864:

I claim, first, The combination of the breech block, A, sliding piston, C, packing spring and recoil spring constructed and operating substantially as and for the purposes set forth.

Second, The sliding needle, j, constructed with a collar or shoulder, j', faced with india-rubber to act as a gas check, as and for the purpose specified.

45,587.—Apparatus for making White Leads.—Thomas J. Coggeshall, New York City:

I claim, first, Surrounding the sides and top of the corroding rooms, wherein metallic lead is converted into carbonate of lead by the process above described, with a stratum of air confined between double casements of glass as herein described, for the purposes specified.

Second, Connecting one or more of the vests, in which the acetic acid is contained, with one or more of the generators in which the carbonic acid gas is formed with one or more of the corroding rooms by means of pipes, fitted with stop cocks, as shown, and operated by a pump, F, substantially as described for the purposes specified.

Third, Providing each of the corroding rooms with a revolving frame upon which the metallic lead is suspended for the purpose of subjecting it to the action of the lead to the uniform influence of the decomposing and carbonating agents.

45,588.—Machine for pressing Hats.—Samuel G. Congdon, Mansfield, Mass., and D. C. Moury, Milford, Mass. Ante-dated Sept. 24, 1864:

I claim, first, The use in a machine for pressing hats of two dies placed edgewise towards each other, substantially in the manner and for the purpose herein shown and described.

Second, The clamp nut, G, with toggle arms, d, e, and hand lever, f, applied in combination with the screw spindle, E, follower, D, and die, E, in the manner and for the purpose set forth.

Third, The use of a wooden block, E, in combination with a steam die, B, constructed and operating substantially as and for the purpose specified.

45,589.—Steam Boiler.—Benjamin F. Cowan, New York City:

I claim, first, Combining in sectional steam boilers and other vessels of wrought or malleable metal for sustaining pressure from within, a stay rod, D, extending through the same, with the following joints, f, and the flanges, h, of the sections, substantially as described.

Second, I claim the sectional joints, f, of the several sections of the boiler, with curved or flaring edges, projecting inwardly, substantially as and for the purpose described.

Third, I claim placing anchors like J, or its equivalents, across the boiler or other vessels in the line of its diameter, substantially as above described.

[This invention consists in making a boiler in sections united by means of flanges which project inwardly from the circumference of the sections, the end sections being rounded at their outer ends and the sections being held together by a rod extending axially through them and secured by means of washers and nuts, thereby making a boiler capable of vibration without tearing open its joints.]

45,590.—Apparatus for graining Pails.—J. R. and A. J. Cross, Chicago, Ill.:

We claim, first, Constructing the bed of elastic material used in graining machines in the form herein shown, substantially as and for the purposes specified.

Second, We claim arranging the elastic material aforesaid, whether curved or rectilinear in form in a series of distinct staves or designs, substantially as and for the purposes herein shown and set forth.

Third, We claim the arrangement of the expandable plate, E, E, and the handle, F, F, provided with the hinge, h, and spring, s, as and for the purposes described.

Fourth, In combination with the last foregoing, we claim the employment of the handle, C, and plates, D, D, as and for the purposes shown and described.

45,591.—Stone-cutting Machine.—Gustavus Cuppers, New York City:

I claim pivoting the chisel frame, H, to the main frame, E, of the stone-cutting machine so as to maintain a vertical position or to adjust the inclination of the chisel for rough hewing and finishing, substantially in the manner and for the purposes described.

I also claim the combination of a pivoted adjustable chisel frame with a spring or recoil chisel, when constructed and operated substantially as and for the purposes described.

I also claim the combination of the pivoted adjustable chisel frame, H, with the frames, E and S, for the purpose of feeding the chisel in two different directions over the stone, substantially as herein described.

I also claim the combination of the frames, A, B, E, with the sliding and hinged chisel frame, H, and spring or recoil chisel, K, when constructed and operated substantially as and for the purpose described.

45,592.—Shingle Machine.—E. Drake, Gardiner, Mich.:

I claim, first, The arrangement of the rack, D, pinion, D', levers, K L G, and the loaded lever, H, all combined with the plate, P, to regulate the feed movement of the frame, C, as set forth.

Second, The lever, W, provided with the pawls, V V', in connection with the oblique slat, d', in the plate, X, and with the double adjustable ratchets, u u', or with single ratchets, for the purpose of giving and regulating the lateral feed movement of the bolt, for the purpose specified.

[This invention relates to a new and improved shingle machine of that class in which a circular saw is employed for cutting the shingles from the bolt, and the invention consists in a novel means employed for feeding the bolt to the saw, and also in a novel means for adjusting the bolt so that the same may be cut of any required thickness and of different tapers as may be required.]

45,593.—Mode of attaching Thills to Axles.—Edward Dugdale, New York City:

I claim the thill iron, E, provided with the clip, F, and the flange, G, and fitted on the arm, B, of the axle between the two shoulders, C, D, with the inner part of the hub projecting over the flange, substantially as and for the purpose herein set forth.

[The object of this invention is to obtain a means for attaching thills to axles which will admit of the former being fitted and secured to the latter with the greatest facility, and also of being readily detached therefrom, the invention at the same time admitting of the thill iron being readily tightened at any time should it become loose by wear or otherwise.]