

## RECENTLY PATENTED INVENTIONS.

## Engineering.

**STEAM ENGINE.**—John N. Kemmerer, Loganton, Pa. This invention provides a novel mechanism to apply power to the crank shaft, levers arranged side by side having a sliding connection with the crank, one of the levers being pivotally secured at one side of the shaft and the other at the opposite side, with operating devices to rock the levers, thus overcoming dead centers and increasing the power. Improved throttle devices are also provided for use in connection with several steam cylinders and steam channels leading to their opposite ends, so that steam may be admitted to the inner end of one cylinder and the outer end of the other and *vice versa*, there being likewise improvements in the valve gear for operating and controlling the valves of the different cylinders.

**SPARK ARRESTER.**—Langford C. Mabie, Richmond, Va. This is an improvement for locomotive and other high pressure engines designed to entirely eliminate from the products of combustion all sparks and cinders and carry them to a place of temporary deposit, also carrying off the thick black smoke. Within the stack is a novel construction and arrangement of two freely revolving wheels having radial blades set at an inclination to the plane of the wheel like a windmill wheel, the inclination of the blades of the two wheels being reversed to give them revolution in opposite directions, separating, by centrifugal action, the sparks and cinders from the blast at two different points.

**CUT-OFF GOVERNOR.**—Levi O. Harris, Cadillac, Mich. This is an automatic device for steam engines, designed to secure an economy of fuel and the more steady running of the engine. Within a cylindrical casing communicating with the steam chest is an annular chamber in which revolves a closely fitting sleeve having valves on its periphery, and in this sleeve oscillates another sleeve with ports corresponding to the ports of the casing, the first sleeve having an outer extension sleeve connected to a bevel gearing, while the inner one has a shaft connected with the governor levers. In operation the steam has to pass through registering openings, and the ports are thrown more out of register as the engine runs too fast, being in perfect register only as the engine is run at the speed designed.

**WRIST PLATE.**—James Barclay, Sioux City, Iowa. This device consists of two plates or disks arranged concentrically and mounted to turn independently one of the other, one of the disks being connected with the valve rods and the other with the hook or eccentric rod, there being also a locking device for connecting the two disks with each other. The wrist plate thus provided is of simple and durable construction and the arrangement permits the engineer to easily start the engine without being compelled to lift the hook rod and hold it up while manipulating the throttle valve and starting bar.

**BALANCED SLIDE VALVE.**—William T. Harrison, Pooler, Ga. This is a valve of simple and durable construction, arranged to supply the cylinder with a full charge of steam at the time the piston is at the commencement of the stroke. The invention consists of inlet ports formed in the slide valve and a balance plate provided with a port adapted to connect with the valve inlet ports at the time the steam is admitted to the end of the cylinder.

**VEHICLE PROPELLING MECHANISM.**—Isaac B. Jones, Xenia, Ohio. A shaft carrying a cone pulley, and adapted to be driven in either direction by a motor, is located on the vehicle body, a belt connecting this pulley with a second cone pulley on the axle of the vehicle, a convenient shifting mechanism for the belts being provided. The mechanism is simple and durable and permits of readily changing the speed of the vehicle without changing the speed of the motor, while it is also arranged for conveniently running and steering the vehicle in any desired direction.

## Railway Appliances.

**CAR COUPLING.**—E. H. B. Knowlton, West Superior, Wis. This is an improvement in that class of devices known as "twin jaw" couplers, and the invention provides means whereby the jaws can be automatically coupled and locked when brought together, together with means for automatically locking them in an uncoupled position when they are separated. The lock can be quickly and easily operated to uncouple the jaws, and the top surface is without any irregularities or openings to afford lodgment for ice, snow and dirt.

**RAILWAY GATE.**—John S. Chambers, Jr., Allegheny, Pa. This is a swinging gate which will entirely close the crossing, and will fold when raised, thus clearing overhead electric wires and other obstructions. It has a main arm to which is pivoted a supplemental arm, an inclined guide pivoted to the main arm projecting over and beyond the pivot of the arms, while a cable has one end secured to the free end of the supplemental arm and is passed through the guide, its other end being secured to the support at the pivoted end of the main arm. The length of the arms is varied according to the height of the obstructions above the track.

**TRAIN SMOKE CONDUIT.**—Chester L. Morrison, West Point, Va. This invention covers an improvement in devices for carrying away smoke from a locomotive, providing for this purpose a simple and inexpensive apparatus by means of which the cinders, smoke, etc., will be discharged from the rear end of the train, where they cannot annoy the passengers. It consists of a conduit made up in sections and open at each end, the section on the locomotive having a flaring mouth which is open over the smoke stack, and the conduit running the entire length of the train. Simple and effective means are provided for coupling the several sections together, so that they will be smoke tight and will conform to the different movements of the cars.

## Mechanical Appliances.

**PUNCH.**—Francis N. Simmonds, San Francisco, Cal. This is an inexpensive article to make, while designed to operate efficiently, the penetrating portion of the punch being cheaply and easily renewed after it is worn out. It has a removable face with a screw-threaded bore aligning with that of the body to which it is attached, and a bolt with an operating head is passed down through the body and face, the lower end of the bolt being threaded to engage the threads of the bore of the face. The lower end of the bolt has a slightly projecting hardened centering point, the several parts being so firmly united that there is no liability of the face getting loose upon the bolt.

**COAL DRILL.**—Charles S. Sheppard, Pittston, Pa. An auger is formed at one end with a dovetailed groove having its sides diverging outwardly, and a center cutter engages with its shank one side of the groove, while a cutter standing at angle thereto engages with its shank the other side of the groove, a bolt in the auger end having its head wedge-shaped engaging the adjacent inner sides of the shanks of the center and cutter. The drill is of simple construction, and is designed to easily and conveniently cut a large opening in the coal without requiring much power.

## Agricultural.

**PLANT FRAME.**—Edward K. Jones, Portland, Oregon. This frame has a soil receptacle, with a cover and fruit protector having openings for the plants to project through, and prevents the washing away of the soil and its spattering upon the fruit. It is especially adapted for strawberry culture, and is preferably 5½ by 12 feet in size, accommodating 12 dozen plants, the openings being 4 inches in diameter. It is adapted for use in all localities, the plants being readily protected from heat or cold, and it is provided with perfect means for ventilation, irrigation, and drainage. With this frame fruit may be produced very early in the season, and its production continued until very late, young plants being forced to early maturity and made to yield large quantities the first season.

**ANT HILL CUTTER.**—John T. ym, North Bend, Neb. This device comprises a frame with side runners, with a cutter arranged obliquely to and secured at its front end to one of the runners, while adapted at its rear end to permit trash and the like to pass off. It is designed to be dragged over the ground by a horse, when the cutter will strip the ant hills off close to the ground surface, so they can be readily removed and the ground left in condition for cultivation. By means of an adjusting lever the cutter may be lifted and held off the ground in moving the machine from place to place.

## Miscellaneous.

**METHOD OF MINING COAL.**—Peter C. Forrester, Wilkeson, Washington. The method of mining provided by this invention consists of first forming in the vein a series of vertical cuts and horizontal cuts or drifts or cross cuts intersecting with the vertical cuts, and then undercutting or blasting from below the pillars of material formed between the cuts and cross cuts. By this method the miner will not be at all subjected to the obnoxious gases arising in blasting or undercutting, and can always go to a place of safety whenever a blast is fired, while there is also a saving of lumber used in building the cuts.

**VEHICLE WHEEL.**—August Bauer, Sandusky, Ohio. This wheel has a circular brace fastened to it at a point between the hub and felly, the brace consisting of two circular rings or flanges, with intermediate filling blocks or sections between the spokes, the rings and filling blocks being clamped together by bolts or rivets. This improvement may be applied to any old wheel to strengthen it and prolong its usefulness, preventing the spokes from breaking, bending or getting loose.

**TAIL BOARD SPRING.**—Freeman Nickerson, Jr., Fall River, Mass. This is a combined spring and catch, constructed of two pieces of metal, for keeping the tail board of a vehicle closed when shut, while readily admitting of the opening or dropping of the board when the vehicle is to be loaded or unloaded. The spring is made of sheet steel, and the catch, secured to it is very solid and strong and made to project beyond the free end of the spring, where it is of a roll or hook shape above, to form a ready handle for lifting the spring. The device is designed to be much cheaper than the ordinary device for the purpose.

**WIRING FENCE PICKETS.**—Lemuel H. Slagle, East Brady, Pa. A machine of simple and durable construction, designed to be very effective for this purpose, is provided by this invention, the machine crossing the wires after the picket is inserted, and having a tension device to give a proper tension and twisting to the sets of wires. A series of levers are pivoted on a post, each lever having forked ends to receive the wires, and a retaining wire is held on each lever to extend across the fork and hold the wires in place, while a bar is pivotally connected to the levers to give them a swinging motion.

**LADDER.**—James F. Mitchell, Titusville, Fla. This ladder is especially designed for picking oranges and other fruit. It has a straight section, hinged to the top of which is a section that is curved and extended laterally in a plane at an angle of not less than forty-five degrees to the body of the ladder, the top section being in most cases extended at a right angle to the body portion.

**FEED TROUGH.**—Earl B. French, Oakland, Cal. In this feed trough the feed is supplied gradually, so that the animal will be compelled to eat his feed slowly and thoroughly masticate it. The trough is made with a side reservoir separated from the other portion by a removable partition, a ratchet mechanism holding the partition in position in the reservoir. The flow of feed is controlled by the movement of the partition by the animal feeding, this also preventing the trough from clogging, while the adjustment of the partition provides for different kinds of food.

## KNOCKDOWN EXHIBITION STAND.

Herman A. J. Rieckert, New York City. This stand has two connected corner posts, sides being hinged to the posts and shelves hinged to the connecting bars of the posts, each made in two parts hinged together and resting on cleats formed on the sides. The stand is of simple and durable construction, and can be readily folded for storing and transportation. It is arranged to be conveniently set up for use in stores, hotels, and like places, for exhibiting goods.

**JOURNAL PAGE FILE.**—John O'Rourke, Mandan, North Dakota. Covers adapted to inclose heavy indexed pages are hinged to a central base portion, a jointed section forming the back edge and permitting the file to be closed as an ordinary book. On the base is a spring-pressed bar carrying curved file posts, the doubled-over upper ends of which enter sockets in the top of posts secured to suitable plates on the base, the pressing down of the curved posts forming the usual file loops, and enabling the journal sheets to be turned freely from one cover to the other. The improvement forms a simple file which may be conveniently operated, and in which may be kept journal sheets, statements, summaries, and matters of a similar nature, in form for ready reference.

**BEER DRAWING APPARATUS.**—Peter F. Gaynor, Greenbush, N. Y. This invention affords a simple means by which beer may be conveniently drawn under pressure from the cask, the device being inserted in the cask without spilling any beer or freeing any gas. The spile is of the usual external shape and within it is a seat against which fits a rubber packing valve having at its lower end a swinging flap normally pressed upward by the pressure within the cask. A novel form of stem and handle takes the place of the ordinary cock, the beer flowing as readily through it as through the usual faucet.

**BAR FIXTURES.**—John Neumann, Brooklyn, N. Y. This invention provides separable and interchangeable bar fixtures, such as rising chambers, shelves, and drain trays, that the position of the parts may be changed as desired, and so that any of the parts may be readily detached from other adjacent parts for cleansing or repair. The improvement is applicable to counters or bars where liquors of various kinds are served to customers by the glass.

**LAMP BURNER.**—Patrick J. F. Graeme, Beulah, Canada. A triangular frame is adapted for vertical movement at each side of the wick, and there are horizontal spring-actuated piston rods at each side of the frames, each having a head block contacting with the frames, while telescopic hoods secured to the head blocks inclose the wick tube. The construction is such that the flame may be extinguished and the wick trimmed automatically upon lowering the wick, it being also provided that the wick may be raised and lowered without operating the extinguishing and trimming mechanism.

**TEA KETTLE.**—John Black and Fred. C. A. Natus, South Chicago, Ill. The breast of this kettle rises above the general level of the top and above the filling opening, forming an air space when the kettle is filled, and this space is connected by a tube with the upper part of the spout, and the bail when thrown over rests on projections which prevent undue heating. By this construction the water in the kettle is prevented from boiling over at either the spout or filling opening, and in handling the kettle there is no danger of burning or scalding the hands.

**COOLING APPARATUS.**—Sherman L. Smith, Plymouth Penn. This is an apparatus designed to facilitate the transportation in good condition of butter and like articles in warm weather, providing therefor a tray-holding receptacle adapted to be placed in a cask containing ice or spring water, there being a locking connection between the receptacle and the cask. The receptacle is preferably made of sheet metal, and its construction is such that portions of its contents may be readily removed without disturbing others.

**TOY.**—George W. Galbreath, Sedalia, Mo. This is a device constructed somewhat in the nature of a target, and provided with an attached elastic cord carrying a weight which may be made to strike the target, the latter when being struck at the center automatically sounding an alarm. The toy may be held in the hand, one or both hands being employed in its use.

**TRUSS.**—William A. Adair, Moline, Kansas. This is an improvement in trusses to be worn on the body in cases of hernia, and is light, strong, and easily adjustable, to enable the pads to bear where necessary, while it is adapted to conform to the movements of the body, and sufficiently elastic to adapt itself to any momentary local expansion.

**URINAL.**—Charles G. Zeilman, Albany, N. Y. This invention provides an automatically operating flushing device, which also affords a positive seal at all times against the escape of sewer gas. The construction is simple and the parts are not liable to get out of order.

**NOTE.**—Copies of any of the above patents will be furnished by Munn & Co., for 25 cents each. Please send name of the patentee, title of invention and date of this paper.

## NEW BOOKS AND PUBLICATIONS.

**TRAVELS AMONG THE GREAT ANDES OF THE EQUATOR.** By Edward Whympfer. With maps and illustrations. New York: Charles Scribner's Sons. 1892. Pp. xxiv, 456. Price \$6.

**SUPPLEMENTARY APPENDIX TO TRAVELS AMONG THE GREAT ANDES OF THE EQUATOR.** By Edward Whympfer, with contributions from H. W. Bates, F.C.S. (and many others). London: John Murray. 1891. Pp. xxiii, 147.

These sumptuous and richly illustrated volumes it is quite impossible to review within the limits of the space

at our command. Edward Whympfer is the first man who succeeded in climbing the Matterhorn in Switzerland, and his graphic account of his travels and mountain climbing in South America is simply fascinating. The desperate hardships encountered at such high elevations are pictured, and the oddities of the characters met with, whether of his party or not, give an agreeable flavor of humor to the recital. The appendix, a separate volume, touches upon the scientific results of the expedition.

**TRANSACTIONS OF THE AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS.** Vol. VII. 1891. New York: Published by the Institute. Pp. xi, 635.

All that is necessary to say of this very handsome volume is that every electrician should possess it. The papers, their authors, and the discussions annexed to such papers give the highest value to the work as an exponent of advanced electrical views. The steel engraving, portrait of Elihu Thomson, will recall to many the features of the great engineer, the inventor of electric welding and investigator and inventor in many other branches of alternate current work. Among the more notable papers in it may be cited Tesla on Alternating Currents of very high Frequency, Kennelly on inductance, with the discussion and committee's report, and reports on the Frankfort Electrical Congress. But this particularization does not affect the value of the other papers with accompanying discussions.

**ENCYCLOPÉDIE SCIENTIFIQUE DES AIDE-MÉMOIRE, PUBLIÉE SOUS LA DIRECTION DE M. LEAUTE, MEMBRE DE L'INSTITUT.** Etude Expérimentale Calorimétrique de la Machine à Vapeur. Par V. Dwelshauvers-Dery. Paris: Gauthier-Villars et Fils. Pp. 213.—Transmission de la Force Motrice par Air Comprimé ou Rarefié. Par A. Gouilly. Paris: Gauthier-Villars et Fils. Pp. 170.—Résistance des Matériaux. Par M. Duquesnay. Paris: Gauthier-Villars et Fils. Pp. 187.—La Distribution de l'Électricité. Installations Isolées. Par R. V. Picou. Paris: Gauthier-Villars et Fils. Pp. 168. Price per volume, 75 cents.

We note the reception of four little volumes of this encyclopedic aid to memory. The books are all well edited, and the subjects seem well treated. Where required they are illustrated, and the attractive appearance of the books adds materially to their value.

**THE GALVANIC CIRCUIT INVESTIGATED MATHEMATICALLY.** By Dr. G. S. Ohm. New York: D. Van Nostrand Company. 1891. Pp. 269. Price 50 cents.

The science series of the D. Van Nostrand Company has never received a more interesting acquisition than the present one. It is a translation of the famous paper of Dr. G. S. Ohm, published in 1827, in which Ohm's law was enunciated for the first time. The only previous translation has been hard to obtain, and electricians will generally welcome the present translation.

**A MANUAL OF PHONOGRAPHY, OR WRITING BY SOUND.** By Isaac Pitman. London: Isaac Pitman & Sons. Australia: Edwards, Dunlop & Co. 1890. Pp. 87. Price 40 cents.

**THE PHONOGRAPHIC TEACHER.** By Isaac Pitman. New York: Isaac Pitman & Sons. Canada: The Copp, Clark Co. 1891. Pp. 46. Price 15 cents.

**PRACTICAL CARRIAGE BUILDING.** Compiled by M. T. Richardson. Profusely illustrated. Vol. 1. New York: M. T. Richardson Co. 1892. Pp. 222. Price \$1.

We have before now favorably commented on previous works on practical blacksmithing. We can extend the same favorable consideration to this book. It seems thoroughly practical and to the point, and well adapted for repairers who have many different cases of breakage and wear to deal with. Numerous illustrations are given to elucidate the text. Many contributions from practical workers make the book read like an emanation of experience.

**STEREOTYPING.** The papier mache process. By C. S. Partridge. Chicago, Ill. 1892. Pp. 139.

The long process of stereotyping is given in detail by Mr. Partridge. The tools, presses, etc., required are illustrated, and every step of the process receives due consideration. The author claims to have embodied the best receipts and processes as evolved from seventeen years' personal experience.

**IRRIGATION CANALS AND OTHER IRRIGATION WORKS.** By P. J. Flynn, C.E. San Francisco, California. 1892. (Two vols. in one.) Pp. xx, 398; x, 283. Price \$8.

The general subject of open channel irrigation as employed in the Western regions of the United States is the topic treated in the seven hundred pages of this work. The first volume is devoted to irrigation canals and other irrigation works, the second to flow of water in irrigation canals. We can only make the old complaint that space forbids anything like an adequate review of this very handsome work. It is a credit to the publisher as well as to the author, and will be found of extensive use.

**SAFETY VALVES: THEIR HISTORY, INVENTION, AND CALCULATION.** By William B. Le Van. New York: N. W. Henley & Co. Pp. xiv, 155. Price \$2.

As the safety of a boiler and the life of its engineer and others depend on the all-important safety valve, it is eminently appropriate that a book should be devoted to so important a topic. Sticking safety valves,