

RECENTLY PATENTED INVENTIONS.

Of Interest to Farmers.

HEATER FOR BROODERS.—J. C. NICHOLES, Blue Mound, Ill. The invention refers to poultry culture, and its object is to provide a heater arranged to produce a proper heating of the air supplied to the young, to cause moistening of the heated air, and to allow convenient removal of the heater from the brooder, whenever it is desired, for cleaning, repairing or other purposes.

CULTIVATOR ATTACHMENT.—D. B. BROWNING, Morrison, Okla. In operation the fender is supported by the hanger arm, and the runner is adjusted below the edge of the blade to prevent earth thrown up from covering the plants, yet permitting some earth to be thrown toward the plants at the roots. The runners prevent the fender being removed by earth thrown up by the plow. A chain acts to take the weight of the blade from the runners, when turning or moving. The runner permits the fender to follow ground inequalities, so as to protect the plants, even when they occupy a lower plane than that traversed by the cultivator wheels.

Of General Interest.

NON-REFILLABLE BOTTLE.—M. FORST, New York, N. Y. The aim in this case is to provide a new and improved non-refillable bottle, which is simple in construction and arranged to effectively prevent refilling of the bottle with spurious liquids by unauthorized parties, especially when the bottle is held in a horizontal position.

HOSE CONNECTION FOR STEAM THAW-POINTS.—J. R. MATHEWS, Fairbanks, Alaska. The purpose in this invention is to provide details of construction for connections, which enables the attachment in a simple and secure manner, of one end of a steam conducting hose upon the body of a thaw-point into frozen ground, that is to be thawed by steam passing down through the thaw-point.

LENS-MOUNTING.—G. LOWENSTEIN, New York, N. Y. The more particular purpose in this case is to produce a lens so readily detachable from the framework which normally supports it and so readily attachable to the same, that any person can instantly remove the lens from the frame or replace it, the construction, however, being such that when the lens is upon the frame it is perfectly rigid and free from lost motion.

FEED-DISTRIBUTER FOR VANNERS.—C. P. WHITMORE, Salt Lake City, Utah. The distributor is adapted to be disposed transversely over the conveyer. Side rails are on the distributor and a rear central member with obliquely disposed members connects the rear member with the rails. Guide members are provided at right angles to the rails, and material is introduced behind the slot in the rear guide member. Buffers direct the material in front of the last named member, there being rows of guide members in front of the same, to distribute the material, which flows to and through the feeder openings in front.

MEANS FOR KEEPING ACCOUNTS.—A. L. GRAYSON, Rutherfordton, N. C. The object in this improvement is to provide means for keeping accounts in banks and other institutions and business houses, and arranged to reduce the liability of clerical errors and mistakes to a minimum by providing movable tapes, one for each customer's account, the tapes being adapted to receive thereon the daily transactions.

SEAM-RIPPER.—T. F. FREEMAN, Dover, Maine. The invention relates more particularly to rippers such as combine a lap-board and cutter, and are adapted to be used for opening of letters, wrappers, seams of garments, and the like. The object is to provide a device adapted to be adjusted across the lap of the user, so that the cutter will be in a convenient position for use, thus leaving both hands of the operator free.

CEILING CONSTRUCTION.—P. ALLINIO, San Pablo, Cal. The inventor's object is to eliminate the furring-strips and support the lath directly from the concrete constituting the floor end at a distance therefrom. The construction is thus rendered fire-proof, the total thickness is reduced and the plaster may be applied immediately after the wooden forms are removed.

Hardware.

RAZOR-STROP.—M. KRISCHER, New York, N. Y. This invention refers to improvements in the means for securing the yoke which holds the attaching ring to the end of the strop. The object is to provide means for use in securing the ringholder to the strop, in such a manner as to obviate the use of a bolt and nut, as in the constructions at present in the market.

JAR-OPENER.—M. C. DEARING, Haverhill, Mass. In this case the inventor provides a device which can be arranged about the top of a fruit jar or other receptacle, and which has means whereby the cover of the jar may be readily removed, without danger of injury to the same or to the rubber washer on which it rests.

Household Utilities.

KITCHEN-SINK COVER.—A. G. DEMAREST, New York, N. Y. The more particular object

here is to produce a type of sink cover suitable for use in the kitchen and provided with openings of special form through which hot and cold water may pass from the spigots, and further provided with smaller openings for facilitating the drainage of such water as may be accidentally spilled upon the sink cover.

COT FOR CHILDREN.—MURIEL M. S. BINNEY, St. Clair, Elizabeth Bay, Sydney, New South Wales, Australia. The purpose of the invention is to provide what is called a collapsible safety cot which shall be capable of being folded up into a small compass when not in use, and which when set up shall form a rigid structure wherein a child may be left without fear of his falling out or otherwise coming to any harm.

COFFEE-URN.—O. A. NENNINGER, El Paso, Texas. The coffee may be extracted quickly by causing boiling water to percolate through the ground berries supported above an inner vessel for holding the extract. Means are provided for passing the liquid repeatedly through the mass, to increase the strength of the extract. The flow of the liquid in either case is produced by steam generated in the boiler or outer vessel, the pressure of which can be controlled by means of a stop cock.

Machines and Mechanical Devices.

WASHING-MACHINE.—J. W. SEIFERT, St. Louis, Mo. The invention comprises a combination with the body of the machine, and a kettle supported therein, of a reticulated closed drum, parallel levers in which the drum is journaled, a shaft the ends of which extend from the body, to serve as the pivots of the levers, a sprocket wheel fixed on one of the drum posts, another mounted loose on one of the lever pivots and furnished with a rigid handle socket, and a chain applied to and containing the two sprocket wheels.

CASH REGISTER, INDICATOR, AND RECORDER.—J. F. PARKER, Kansas City, Mo. The invention is an improvement in registers in which are employed multiple receptacles or money tills and a series of vertical banks of keys bearing numbers and characters corresponding to others inscribed on registering and printing wheels also slidable indicating tablets that are all movable and adapted to register and display or indicate and also print the amount of a sale, the initial of the clerk, and the character of the transaction. Mr. Parker has made an improvement on the above machine and the patent is on that class having a series of movable keys which constitute the primary means for operating, through the medium of intermediate devices, the registering, indicating, and recording mechanism proper.

PEANUT-PICKING MACHINE.—F. F. FERGUSON, Murfreesboro, N. C. In operation the vines are fed through a chute against a drum, and are engaged by pins, and carried rearwardly between vibrating frames, and against spring teeth. The passage of vines beneath the teeth, separates them from each other, and removes a greater part of the nuts therefrom, the nuts falling through the drum onto the carrier, which delivers them onto the stemming device at the rear, the fan acting to clean them from the leaves and broken stems.

MOLD FOR CONCRETE-WALL CONSTRUCTION.—G. TAUBERT, Pittsfield, Mass. More particularly this invention relates to means for holding the mold sections in engagement with the walls and for raising them step by step as the wall is built up. It also involves certain construction in collapsible cores to be used in connection with the molds and co-operating with the support of the mold sections to permit the removal of the latter.

WIRE-FENCE STRETCHER.—W. HOPPER, Jefferson, Iowa. In this patent the invention pertains to improvements in devices for stretching wire fencing while the latter is being secured to the fence posts, and relates more particularly to the mechanism for engaging with one of the posts and with a clamp secured to the fence for stretching the latter.

CLAMP FOR WOVEN - WIRE - FENCE STRETCHERS.—W. HOPPER, Jefferson, Iowa. The invention relates more particularly to stretchers of the type shown in Mr. Hopper's previous patent. The present invention relates solely to the clamp, and this clamp may be used in connection with any suitable tension mechanism.

AIR-SHIP.—F. L. ORR, Omaha, Neb. In its broad comprehension, the invention comprises an aeroplane, a basket, car, or other similar means affording carrying support; and means consisting of a combustion chamber into which gas, or other fluid may be charged and the fluid charge be ignited, and the ignited charge liberated through an exhaust opening into the air, directly under the aeroplane.

CLOCK AND COIN-FREED WINDING APPARATUS.—A. G. P. WIINGAARD, Rømersgade 3, Copenhagen, Denmark. This invention is designed to provide mechanism in combination with a clock adapted to collect definite sums of money at certain times, for instance, the premiums on an insurance policy payable in daily or weekly rates, savings bank deposits, and the like, thus doing away with the cost of collecting these payments, which is often out of all proportion with the amount collected.

SAW LEVELING AND STRETCHING MACHINE.—N. L. BOTTEN, Opelousas, La. The

improvement is in machines for use in removing lumps, kinks, ridges, etc., in saws, commonly known as "leveling," preparatory to stretching the saw in adjusting its "tensions," which is secured in machines as now generally used by passing the saw longitudinally between rollers of equal width and thereby stretching the saw equally on both surfaces.

SAFETY ELEVATOR-CAGE.—C. H. STURGIS, Granville, Ill. The cage is provided with dogs at its bottom, adapted to be thrown into engagement with hooks hung in sets to swing in channel irons in the shaft, a stud actuating means to throw the dogs into engagement with the hooks, over which it is adapted to slide during upward movement of the cage, the dogs locking with one set of hooks should the cage start downward. At the upper part of the shaft a trip throws the dogs inwardly and free from the hooks, means holding the dogs away from the hooks swung in the shaft. Means permit the dogs to engage the hooks should the cable break.

CONCRETE-BLOCK MACHINE.—E. P. AUGER, Corinth, Miss. This machine makes blocks of concrete for use in building of various kinds, employing concrete material. An object of the invention is to provide a device in which the block may be molded and then by the use of a cam lever, the sides of the mold can be loosened and let down vertically, leaving the molded block upon the base from which it can be readily removed.

BUNDLE-WIRING PINNERS.—J. PFEFFER, Spokane, Wash. The invention is in the nature of a machine to be used in fastening together by wire, bundles of small boards, such for instance, as are used in making boxes, and for fastening together shingles into bundles, and other similar uses, and it consists in the construction and arrangement of a pair of pincers for cutting and twisting the wire about the bundle.

MACHINE FOR CASTING LEAD SEALS AND THE LIKE.—N. S. FRIDERICHSEN, 44 Vester Følledvej, Copenhagen, Denmark. The invention consists in the fact that the casting molds for the seals together with their cores are arranged in a disk rotatable between two stationary disks, this rotatable disk during its rotation receives the lead and automatically cuts off the supply, the seals being ejected from the molds after they have sufficiently cooled.

Prime Movers and Their Accessories.

COOLING DEVICE FOR EXPLOSIVE ENGINES.—G. BRAUN, 93 Quai de Valmy, Paris, France. The invention relates to means for cooling the cylinders and valve boxes of explosion engines of all kinds, but more especially and with more advantages in the case of the engines of agricultural and other locomobile machines and automobile vehicles, and has for its object to provide an efficient cooling device for such engines.

STEAM-ACTUATED VALVE.—A. MEHLHORN, Dietrichsdorf, near Kiel, Germany. The valve gear is for use for direct acting steam pumps, of the kind in which at each end of the pump piston stroke a piston valve is shifted by moving parts of the pump until a steam inlet is opened, whereupon the piston valve is moved to the end of its stroke by steam pressure alone.

EXPLOSION-TURBINE.—P. O. POULSON, Brigham, Utah. The invention pertains to turbines and gas engines, and the object is to produce a turbine which will be propelled by exploding charges within the same. The general purpose is to produce a prime mover which will be efficient in operation and extremely simple in construction.

Railways and Their Accessories.

METAL RAILWAY-TIE.—J. R. ROBINSON and J. F. SUGRUE, Ennis, Texas. The invention relates to improvements in ties constructed from one piece of metal and provided with integral clamps for the rails. It provides for the cheapest construction of such a tie, without the sacrifice of strength, and to render the tie more or less yielding between the rails, the material cut away in the side flanges to accomplish such a result, being utilized as stays or braces.

Pertaining to Vehicles.

CARBURETER.—P. BERTRAND, New York, N. Y., and J. GOUBILLON, Vaulx en Velin, France. The aim of the invention is to produce a device which will operate to produce a thorough evaporation of the gasoline or other fuel in large quantities, and which will afford means for nicely regulating the vaporization of the gasoline and the proportion of gas and air which passes from the carbureter to the engine.

PROTECTIVE DEVICE FOR RUBBER TIRES.—H. W. HARDING, New York, N. Y. One purpose of the inventor is to provide a chain or series of chains especially constructed for introduction into pneumatic tires to protect the area of the tire most liable to puncture, the chains being so constructed and placed that their radial line from the center of the tire within the protected area will pass through at least one thickness of the metal used in the construction of the chains.

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



Full hints to correspondents were printed at the head of this column in the issue of March 13th or will be sent by mail on request.

(12021) A. T. G. A. writes: In your issue of October 3rd, 1908, F. B., No. 10867, asks why the days and nights are not equal on the days the sun crosses the celestial equator. I have for many years been impressed with the care, patience, and directness of your answers to the many inquiries. It has been the most interesting column of the paper to me. In this one particular case, however, may I suggest you do not include the main reason for the discrepancy. In some almanacs the time of sunrise and sunset is computed for the instant the first glimpse (or the last) of the sun's disk would be seen on the true horizon. Allowance is made for the semi-diameter of the sun and for the refraction of the atmosphere. This would cause the sun to appear a few minutes earlier in the morning and to be seen a few minutes longer in the evening, making the day (sometimes) 8 or 9 minutes longer than it would otherwise be. When this happens during the time of lengthening days (as in March) it would cause the equal days and nights to come earlier, and to come later in September. The matter of semi-diameter and refraction is not taken into account by all almanac computers, some giving the moment when the center of the sun would be on the horizon if there were no atmosphere. In such almanacs the equal days and nights come exactly on the days of spring and autumnal equinox, but it is only theoretically so. The equation of time would have the effect only of transferring the time of both sunrise and sunset earlier or later, as the case might be, and so would have no effect upon the length of the time of daylight. There would of course be a slight effect due to the change in the equation of time between sunrise and sunset, but that would scarcely amount to as much as one minute. Pardon my "butting in" in this matter. My appreciation of the uniform accuracy of your answers in all other cases causes me to feel you will understand the spirit in which this correction is sent. A. We appreciate the spirit as well as the substance of the above correction of addition to our former reply.

(12022) W. B. asks: Will you please say through your Notes and Queries columns in which direction with regard to the wind does an ice boat sail fastest? Some say that sailing direct across the wind is best, others assert that sailing slightly into the wind is better for fast sailing, while others believe in sailing slightly before the wind. Can it be scientifically demonstrated apart from actual experiment which of these is correct? A. Undoubtedly an ice yacht sails faster across or into the wind than before the wind. It has been conclusively proved by tests over measured courses and accurate measurement of the wind that ice yachts have sailed much faster than the wind. The angle to the wind at which ice boats will sail fastest depends upon the individual design of the boats; some may sail faster into the wind, but it is probable that the majority would make their best speeds at about 90 deg., i. e., with the wind dead abeam or nearly so.

(12023) J. M. asks: What is cement? How is it manufactured? Why is it always called "Portland" cement? A. "Portland" cement was originally so called from its resemblance when set in artificial stone to Portland stone from the celebrated quarries of that name on an island off the coast of Dorset in England. It is made by calcining at nearly white heat an artificial mixture of carbonate of lime and clay in certain proportions and grinding to powder the clinker so formed. All cements are not called "Portland," that name being used in its present sense to distinguish cements which are made of an artificial mixture, from cements of similar properties made in a similar manner from single natural rocks without admixture. The latter are generally called "Rosendale" (from the name of the place where they were first made) or "natural" cements.

(12024) R. S. P. asks: I will thank you to inform me whether salt will destroy (disintegrate) a cement sidewalk? If it does, what is the chemical combination? A. The theory of action of salt water upon cement is not fully understood, some cement structures exposed to the worst conditions having given most satisfactory results, while others under more favorable conditions have failed in a greater or less degree. The chemical action involved is generally agreed to be as follows: When the cement contains a high percentage of lime, all of the latter is not engaged in stable compounds, and when exposed to sea water, the sulphate of magnesia in the latter combines with the lime, forming calcic sulphate and precipitating magnesia. The discovery of magnesia in cements decomposed by sea water at first led to the supposition that the cause of failure was excess of magnesia in the cement when used. The action is assisted when the cement is alternately wet and dry, as between tides, and the sulphate of

Lime may be washed out if the cement is sufficiently pervious, more being formed by fresh sea water attacking the lime until the latter is destroyed. It is generally agreed that the better the cement is mixed and placed, with especial view to the density of its surface and impermeability, the less it will be attacked by sea water, more or less regardless of its analysis, the only important consideration of the latter being that its hydraulic index should be high, i. e., percentage of lime low.

NEW BOOKS, ETC.

A HANDBOOK OF SMALL TOOLS. By Erik Oberg. New York: John Wiley & Sons, 1909. 517 large 12mo. pp.; 282 illustrations; cloth. Price, \$3.

In the present multiplication of books on all sorts of subjects it is comparatively rarely that one comes across a new publication the subject of which has not already been treated, less comprehensively or less thoroughly or simply earlier, but the present work seems to fill not a "long-felt want" so much as a recently arisen and hitherto unfilled want. The rapid development of highly automatic machine tools and the use of high speeds facilitated by improvements in steel have developed entirely new requirements in the way of tools and the author endeavors to provide instructions in the best modern practice for the benefit of the tool-maker, draftsman, foreman, and shop superintendent. The book is practical and to the point, simple in language, and well suited to the class for which it is particularly intended. The new developments above referred to require more instruction in what tools to make than in how to do it, the latter being generally easily thought out by a good workman, and the author therefore gives his attention primarily to the former. The book is full of useful tables and data for tool making and for those interested in the formulae by which those data are calculated and other simple mathematics are given. The authenticity and originality of the work is sufficiently demonstrated by the fact that it represents the practice of one of the largest and most advanced tool-making firms in the country with which the author was associated for several years.

HOW IT IS DONE: OR, VICTORIES OF THE ENGINEER. By Archibald Williams. New York: Thomas Nelson & Sons, 1908. 12mo.; cloth; pp. 484; 268 ill. Price, \$1.25.

In this book the author has described in simple language how the great engineering feats of the world have been accomplished. Among the subjects treated are railroad engineering, the building of a big ship, bridge building (including an account of suspension and cantilever bridges and detailed descriptions of the Forth Bridge, Blackwell's Island Bridge, and the collapse of the Quebec Bridge), the building of the new Croton Dam, curbing the Nile, notable reservoirs, Panama Canal, harbor works, tunnels and tunneling, mining and mines, power from falling water.

Legal Notices

60 YEARS' EXPERIENCE

PATENTS

TRADE MARKS
DESIGNS
COPYRIGHTS &c.

Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. HANDBOOK on Patents sent free. Oldest agency for securing patents. Patents taken through Munn & Co. receive special notice, without charge, in the

Scientific American.

A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms, \$3 a year; four months, \$1. Sold by all newsdealers. MUNN & Co. 361 Broadway, New York
Branch Office, 625 F St., Washington, D. C.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending

March 9, 1909,

AND EACH BEARING THAT DATE

[See note at end of list about copies of these patents.]

Abdomen compress, T. P. Taylor..... 915,049
Abdomen compress attachment for corsets, T. P. Taylor..... 915,050
Acid, mercury salt of para-aminophenyl-arsenic, W. Grutten..... 914,408
Addressing machine, Walrod & May..... 914,999
Advertising device, Guerrant & Srdnor..... 914,656
Aeroplane, H. Mueller..... 914,969
Air brake automatic coupling, G. Ripma..... 914,512
Air moistener, C. G. McKendrick..... 914,863
Airship, J. T. Rice..... 914,511
Airship, aeroplane, L. A. Becht..... 914,782
Alpha-halogen-isovaleryl-urea and making the same, E. Saam..... 914,518
Alumino silicate or artificial zeolite, R. Gans..... 914,405
Amusement apparatus, E. J. Sagehomme..... 914,884
Amusement device, J. Huebner..... 914,723
Amusement steps, J. H. Cross..... 914,865
Animal serum obtaining, R. H. Deutschmann..... 914,644
Animal trap, A. N. Atkins..... 914,912

Animal trap, W. M. Kaiser..... 915,028
Automatic fountain, A. G. Ionides..... 914,419
Automobile air cushion, J. B. Taylor, Jr..... 914,896
Awning, M. M. Corneney..... 914,639
Ax, brush, F. Hammerly..... 914,947
Band cleaner, space, W. H. Schuyler..... 914,522
Band resaw and double jointer, J. McWiliams..... 914,746
Banjo hand support, D. E. Hartnett..... 914,660
Bar, See Railway rail tie bar.
Barrel or keg and head therefor, wooden, J. W. Brainard..... 914,787
Beam, walking, H. Shannon..... 914,608
Bearing, F. W. Salmon..... 914,520
Bed bottom fabric, F. W. Kinney..... 914,958
Bed clamp, A. T. Sawyer, reissue..... 12,926
Bed settee, J. Phillips..... 914,671
Bedstead crib attachment, V. O. Crawford..... 914,641
Belt coupling, J. Brenner..... 914,434
Belt stretcher, A. C. Donell..... 914,815
Binder, loose leaf, C. L. Baldauf..... 914,781
Binder or loose sheet holder, temporary, H. F. Bushong..... 914,383
Binder, temporary, C. A. Hartmann..... 914,953
Blackening box, C. E. Conder..... 914,638
Blade holder, Dubring & Wobensmith..... 914,707
Blanket clamp, D. E. Coe..... 914,637
Block mounting, swivel, J. Ward..... 914,683
Block signaling system, H. M. Coulter..... 914,386
Robbin holder, T. J. Maudock..... 914,742
Boiler and furnace, combined, W. J. Ellis..... 914,940
Boiler flue cleaner, J. J. Flynn..... 914,749
Boiler furnace, J. C. Parker..... 914,749
Boiler tube cleaner, E. Mettler..... 914,592
Boilers, etc., protective covering for blow-off pipes of steam, J. Beattie..... 915,050
Bolt clipper, J. A. Alley..... 914,910
Book, E. Davis..... 914,764
Boot and shoe exhibiting device, E. Lange-nohl..... 914,431
Boot and shoe insole, J. J. Ramsey..... 914,674
Boot and shoe upper and boot, toe therefor, H. C. Jenney..... 914,724
Boot or shoe form, J. S. Hansen..... 914,409
Boring appliance, A. J. Signor..... 914,759
Bottle labeling machine, N. Muslar..... 915,035
Bottle, non-refillable, C. S. Thomas..... 914,529
Bottle, non-refillable, Schmitz & Shanahan..... 914,885
Bottles, cans, etc., powder distributor and closure for, C. H. Van Rensselaer..... 914,766
Box fastener, R. Schleicher..... 915,045
Box lid holder and box opener, Bergum & Bjerkel..... 914,919
Box making machine, W. M. Gentile..... 914,820
Bracket, expandible, W. S. Thornton..... 914,533
Bracket, H. Zimmerman..... 914,774
Bracket, Potter & Louis..... 914,974
Bracket support, A. G. Crago..... 914,387
Brake beam, R. H. Thompson..... 914,530
Braking device, V. Lamb..... 915,031
Bread cabinet and cutting knife, combined, P. Nelson..... 914,866
Brooder, J. H. Schaefer..... 914,792
Brush cutter, P. P. Dick..... 914,392
Brush, fountain shaving, L. D. Stevens..... 914,526
Brush, sieve cleaner, A. R. Wiens..... 914,687
Brush, stencil, Nickerson & Hughes..... 914,970
Brush, tooth, D. McEachern..... 914,501
Bucket, dumping, H. J. Russell..... 914,753
Bucksaw, F. L. Hammer..... 914,833
Bullet, L. B. Taylor..... 914,902
Burial vault forming mold, A. O. Hunsaker..... 914,417
Burnishing machine, M. Godlewski..... 914,943
Cake press, E. Erickson..... 914,711
Calculating machine, C. A. Meier..... 914,439
Calculator, A. G. Meier..... 914,741
Calf muzzle, P. C. Roberts..... 914,881
Caloric engine, C. L. Fortier..... 914,562
Camera, photographic, L. Borsum..... 914,784
Can heading machine, J. Brakeley..... 914,695
Can opener, A. O. Hanson..... 914,829
Candlestick, R. F. Crooke..... 914,804
Car, etc., burglar alarm, railway, G. Potter, Jr..... 914,508
Car, axle box, railway, J. B. Avington..... 915,011
Car berth wall pocket, sleeping, S. W. Clark..... 914,701
Car, convertible amusement and dining, C. H. Packard..... 914,748
Car coupling, Sznatchko & Stevenson..... 914,895
Car door, grain, D. W. Thomas..... 914,994
Car draft gear, N. H. Surdenik..... 914,990
Car draft gear, railway, W. R. Matthews..... 914,665
Car drop door structure, F. W. Bradley..... 914,786
Car, dumping, W. J. Chance..... 914,925
Car end construction, Julien & Point..... 914,726
Car, passenger, E. T. Robinson..... 914,751
Car stop, automatic, J. J. Fleming..... 914,938
Car ventilator, S. C. Carroll..... 914,924
Carpet sweeper, F. C. Mason..... 914,438
Carriage thill, Cooley & Marks..... 914,555
Carrier, W. Seegers..... 914,697
Carving machine, F. H. Richards..... 914,676
Castings, means for forming threaded openings in, J. Bedell..... 914,915
Check controlled apparatus, C. F. Morris..... 914,596
Churn, F. E. Stagg..... 914,986
Cigar cutter and lighter, W. J. Crowley..... 914,928
Circuit closer, rotary, F. E. Lind..... 914,435
Circuit controller operating mechanism, N. W. Truxal..... 914,535
Cistern automatic cut-off, R. E. Estes..... 914,936
Clay working machine, F. B. Lambert..... 914,735
Clock combined with coin freed winding up apparatus, A. G. P. Wiingaard..... 914,907
Clothes pin, J. B. Anderson..... 914,691
Clutch, electromagnetic, H. Ast..... 914,375
Clutch operating mechanism, H. L. Turney..... 914,536
Coal drill, J. S. Surbaugh..... 914,890
Coal or rock drill, Mayer & Ashford..... 914,966
Coal tippie, E. E. Bull..... 914,698
Cock, gas, C. H. Wiley..... 915,005
Cocoa nut grater, M. E. Hunt..... 915,055
Coin delivery machine, S. Randell..... 914,510
Collisions at sea, device for preventing, G. Fischer..... 914,483
Column girder, etc., J. W. Muldoon..... 914,861
Comb, G. W. Shadle..... 914,979
Comb, hair, Speck & Henschen..... 914,984
Computing machine, Lebbing & Marshall..... 914,467
Concrete block, H. N. Pettibone..... 914,507
Concrete frame for door and window openings, J. H. & D. H. Magdiel..... 914,590
Condenser support, steam, L. R. Alberger..... 914,778
Conduit receptacle, J. S. Stewart..... 914,762
Container, single opening safety, W. Ashbury..... 914,779
Conveyer apparatus, H. B. & J. A. Sauer-
man..... 914,755
Conveyer roller ball bearing, S. L. Goldman..... 914,714
Cooking or heating utensil, E. W. Ham-
burger..... 914,828
Corn planter, automatic, F. N. Adams..... 914,773
Corset, apparel, D. Kops..... 914,732
Corset lacing device, M. B. Gardner..... 914,406
Corsets, means for pinning down waists to, S. Kops..... 914,733
Cotton chopper, Winkler & Thoen..... 915,009
Cotton chopper and cultivator, A. M. & J. W. Thompson..... 914,617
Cotton seed separator, J. T. Cox..... 914,800
Cream separator liner, centrifugal, Hackett & Morgan..... 914,488
Cream separators, cream exit for centrifugal, C. H. Hackett..... 914,487
Creepers, J. Auer..... 914,780
Cross tie, S. Michaels..... 914,967
Cultivator, E. Haiman..... 914,568
Cultivator, A. Bridgen..... 914,788
Cultivator, disk, Bukacek & Hulcius..... 914,921
Cultivator, garden, J. T. Anderson..... 914,911
Culvert, corrugated metallic, H. Mallory..... 914,963
Curling iron, electrically heated, E. Y. Snyder..... 914,888
Current indicating apparatus, J. S. J. Lallie..... 914,959
Current motor, E. Imboden..... 914,574
Curtain pole, J. B. Phinney..... 914,876
Curtain supporter, L. Nachmann..... 914,865
Cuspidor, flush, J. W. Cooper..... 914,927
Cutting, piercing, and marking pen machine, W. J. Naphey..... 914,600
Cycle, C. S. Johnston..... 914,492
Dam, V. G. Fargo..... 914,559
Dam crest, automatically movable, H. Buchler..... 914,789
Delivery machine, Ford..... 914,561
Deodorizing and disinfecting device, Walter & Imman..... 915,040
Derrick pile driver, G. T. Forsyth..... 914,403
Detuning, von Kugelgen & Seward..... 915,029
Die stock, adjustable, I. W. Nommman..... 914,503
Dipping machine, W. B. Crocker..... 914,803
Disinfecting apparatus, V. A. Williams..... 914,544

Economical Production
and shop equipment that is unequalled in facilities and management, enable us to market our

"Star" Lathes
for belt or foot power at most moderate prices, while the quality, efficiency and durability leave nothing to be desired. Write and ask us for catalogue "B". It is interesting.

THE SENECA FALLS MFG. CO.
105 Water St., Seneca Falls, N. Y.

Engine and Foot Lathes
MACHINE SHOP OUTFITS, TOOLS AND SUPPLIES. BEST MATERIALS. BEST WORKMANSHIP. CATALOGUE FREE
SEBASTIAN LATHE CO., 120 Culvert St., Cincinnati, O.

Foot and Power and Turret Lathes, Planers, Shapers, and Drill Presses.
SHEPARD LATHE CO., 133 W. 2d St., Cincinnati, O.

THE "BARNES" Upright Drills
Positive Feed
10 to 50-inch Swing
Send for Drill Catalogue.

W. F. & JNO. BARNES CO.
(Established 1872)
1999 Ruby St., Rockford, Ill.

"Bougie Eyquem"
The FRENCH SPARK PLUG that Protects Your Coil and Magneto
A plug that surpasses anything on the market. Price \$2.50 each. Circular on request.

MONTGOMERY & CO.
105 Fulton Street, New York City

Pipe Cutting and Threading Machine
For Either Hand or Power
This machine is the regular hand machine supplied with a power base, plunger, countershaft, etc., and can be worked as an ordinary power machine or taken from its base for use as a hand machine. Pipe 1/2 in. to 15 in. diameter handled easily in small room. Illustrated catalogue—price list free on application.

THE CURTIS & CURTIS CO.
6 Garden St., Bridgeport, Conn.

Safety Razors FREE
To quickly introduce the celebrated Ideal Shaving and Complexion Soap which beautifies, removes pimples, blotches and all facial eruptions, leaving skin soft and clear and to prove what we claim is true, we will send a box of soap together with the latest Improved Safety Razor outfit in a fine handsome case all complete for shaving. ABSOLUTELY FREE to any one answering this advertisement at once & enclosing 10c, silver or stamps to help pay boxing, packing, mailing, etc. Address:

THE AM. SOAP WORKS. Dept. S.A. 95 Chambers St., N.Y. City.

How to Construct An Independent Interrupter

In SCIENTIFIC AMERICAN SUPPLEMENT, 1615, A. Frederick Collins describes fully and clearly with the help of good drawings how an independent multiple interrupter may be constructed for a large induction coil.

This article should be read in connection with Mr. Collins' article in SCIENTIFIC AMERICAN SUPPLEMENT, 1605, "How to Construct a 100-Mile Wireless Telegraph Outfit."

Each Supplement costs 10 cents; 20 cents for the two. Order from your newsdealer or from

MUNN & CO., 361 Broadway, New York

THIS IS

MODERN SYSTEMS CORRESPONDENCE SCHOOL

THEORY PRACTICE
MECHANICAL ENGINEERS
ACCOUNTANTS
MANUFACTURERS
SYSTEM

The ONLY Correspondence School formulated on practical engineering lines for giving instruction in

Modern Cost Systems; Factory and Commercial Office Systems; Manufacturing Methods and Systems; Shop Organization and Management; Shop Construction and Equipment; Pattern Shop and Foundry Systems; Mechanical Drawing; Mechanical Engineering, etc.

By a Mechanical Engineer who is an acknowledged authority on the subject

Every instructor is a practical man. Every student is considered individually and instruction planned to fit him and his work. Every man is thus able to qualify for a higher position and a better salary.

Modern Systems Correspondence School

Executive Offices, 6 Beacon St., Boston
OSCAR E. PERRIGO, M. E., Educational Director
(Consulting Mechanical Engineer)

New York Office, 132 Nassau Street
NORMAN W. HENLEY, Secretary and Treasurer
(Norman W. Henley Publishing Co.)

Fill out, check subject and send us TODAY the following coupon and we will mail you FREE our Prospectus of valuable information:

Modern Systems Correspondence School
Please send me free your new Prospectus.

NAME.....
OCCUPATION.....
ADDRESS.....

.....Modern Manufacturing Cost Systems.
.....Modern Factory and Commercial Office Systems.
.....Modern Manufacturing Methods and Systems.
.....Modern Systems of Shop Organization and Management.
.....Modern Systems of Shop Construction and Equipment.
.....Modern Pattern Shop and Foundry Systems.
.....Modern Systems of Mechanical Drawing.
.....Modern Systems of Mechanical Engineering. S.A.

Disks, cutting, D. P. Robinson..... 915,043
Door catch, C. R. Cochran..... 914,796
Door catch, H. P. Connor..... 914,798
Door controlling device, I. Filson..... 914,817
Door hanger, car, J. E. Hill..... 914,411
Door lock, P. P. Piegner..... 914,660
Double acting clamp, J. M. Goodnight..... 914,567
Dough raising apparatus, L. H. Young..... 915,040
Drainage level, P. Gutveit, Jr..... 914,945
Dressmaker's gage and stand, W. A. De Garis..... 914,931
Drill adjusting device, grain, W. F. Jacobs..... 914,843
Drilling machine, Brown & Johnson..... 914,479
Dust pan, C. Gabel..... 914,484
Dynamite, machine for packing explosive gelatin, W. I. Donaldson..... 914,396
Dynamite shell machine folder, J. A. Johnson..... 914,578
Electric accumulator plate, Guyon & Vicierey..... 914,657
Electric cigar lighter, J. W. Todd, Jr..... 914,965
Electric controller, F. E. Case..... 915,016
Electric current and voltage regulator, S. B. Storer..... 914,892
Electric furnace, S. F. Hall..... 914,489
Electric igniter switch, automatic, C. L. Vannort..... 914,537
Electric light cord or cable adjuster, F. E. & A. C. Walker..... 914,768
Electric light, portable, G. R. Radley..... 914,975
Electric switch, S. G. Read..... 914,878
Electric switch lock, W. P. Neubert..... 914,445
Electric switch shunt contact, W. M. Scott..... 914,677
Electrical insect destroyer, P. J. Peterson..... 914,875
Electrically operated brake, C. Saunders..... 914,756
Electricity, device for vending, E. Evans..... 914,398
Electricity rectifier, T. J. Murphy..... 914,499
Electrode for arc lights, C. P. Steinmetz..... 914,891
Electrolytic apparatus, O. Meyer..... 914,856
Electrotype plates, backing, G. E. Dunton..... 915,021
Elevating and cleaning material of a granular nature, apparatus for, F. Beduwe..... 914,475
Elevator and mine cage breakaway clutch, M. C. Hutchings..... 914,841
Embroidery needle machine, C. F. Mack..... 914,664
Engine, J. H. Smith..... 914,760
Engine electric ignition apparatus, internal combustion, C. H. Thordarson..... 914,533
Engine explosive mixture, combustion, P. Winand..... 914,624
Engine starting mechanism, internal combustion, F. W. Teves..... 914,615
Engine steering device, traction, A. Harold..... 914,951
Engine's alarm, E. McClintock..... 914,445
Envelope, W. D. Smith..... 914,382
Envelope seal, H. Hennick..... 914,918
Explosive engine, R. McMyers..... 914,864
Eyelet, Donnelly & Blanthorn..... 914,705
Fabric and weaving the same, tubular, E. Kunzli..... 914,429
Fabric bleaching and dyeing machine, G. Collis..... 914,797
Fan, electric, A. T. Hoevet..... 914,413
Fare box, registering, C. E. Gierding..... 914,821
Faucet, W. C. Winfield..... 914,473
Faucet and combination thereof, F. J. Firth..... 914,400
Feeder, poultry, J. W. Harper..... 914,720
Fence post, W. A. Oliphant..... 914,867
Fender, J. W. Sprint..... 914,985
Filing system, vertical, J. B. Perrine..... 914,452
Film frame carrier, adjustable, E. Biechele..... 914,604
Filter, C. R. Perry, et al..... 915,038
Filter press plate, J. W. Biles..... 914,470
Fire escape, G. H. Johnson..... 914,661
Fireproof door (I-beam construction), D. H. Maguire..... 914,581
Fire protection system, H. B. Helm..... 914,721
Firearm auxiliary stock, H. Renfors..... 914,675
Fish hook, Bradley & Unkefer..... 914,478
Fish hook, C. M. Willis..... 914,906
Flask, molder's, J. F. Lamb..... 914,585
Flue stopper, M. M. Stearling..... 914,988
Fluid circulating and cooling apparatus, A. R. & F. S. Welch..... 914,686
Flushing apparatus, J. E. Longstreet..... 914,587
Food products and making same, A. Behr..... 914,379
Frame or molders' use, extensible, J. F. Lamb..... 914,584
Friction insert for braking surfaces, F. C. Miller..... 914,504
Fruit picker, G. L. Nixon..... 914,502
Fruit stand, folding, J. H. Sabo..... 914,606
Fuel, compound, A. D. Shepard..... 914,523
Furnace charging apparatus, blast, Lee & Martin..... 914,432
Furnaces, apparatus for feeding flour iron ore to blast, E. L. Harper, Jr..... 914,830
Furniture, adjustable, E. G. Watkins..... 914,538
Furniture, article of, E. Werner..... 915,002
Furrow opening attachment, O. F. Orndoff..... 914,450
Galvanizing machine, Hall & Hecker..... 914,827
Game apparatus, T. J. Glenn..... 914,655
Game register, pool and billiard, O. Johnson..... 914,420
Garbage receptacle, J. M. Thinnies..... 914,528
Gas conduits, combined liquid separator and indicator for, I. L. Deszendorf..... 914,812
Gas, generating, C. E. Lucke..... 915,034
Gas producer, C. E. Lucke..... 914,653
Gate frame, hinge, A. S. Mackey..... 914,437
Gate operating mechanism, automatic, D. W. Patterson..... 914,505
Gear, friction transmission, Rice & Barrett..... 914,977
Gear, reversing, E. L. Smith..... 914,980
Gearing, changeable speed, W. Morrow..... 914,860
Gears, forming herring bone, N. A. Christensen..... 914,700
Gears, means for casting, J. S. Barnes..... 914,474
Glass drawing apparatus, J. H. Lubbers..... 914,588
Glass gathering and shaping machine, Graves & Whitmore..... 914,823
Glass, making decorated, J. B. Kysle..... 914,734
Glassware carton, L. H. Peltascu..... 914,872
Golf apparatus, captive, R. B. Peter..... 914,873
Grain separator, T. C. Vaughan..... 914,997
Grain shocking apparatus, J. Calder..... 914,790
Gramophone, L. T. Halle..... 914,826
Grapple, J. B. Castagnos..... 915,017
Gravity conveyer, automatic, S. Hedraim..... 914,832
Grinding device, W. S. Hannan..... 914,718
Grinding machine, Taylor & Rochefort..... 914,763
Hammer, J. Witney..... 914,680
Hammer and hammer support, J. E. Akin..... 914,545
Hammer drop board, drop, W. E. Fifth..... 914,560
Hamper, hanging, Froehlich & Morison..... 914,662
Handle fastening, H. V. Jones..... 914,846
Harness hanger and stretcher, combined, J. Billmyer..... 914,548
Harvester, corn, S. Mohler..... 914,494
Harvesting device, W. L. Griffin..... 914,825
Harvester snapping roller, corn, J. A. Stone..... 914,465
Hat brim press to form wet edges, C. E. Sackett..... 914,519
Hay stacker, C. W. Davis..... 914,388
Head rest, W. N. Greer..... 915,025
Heater, G. L. Fogler..... 914,402
Heater, L. B. Piper..... 914,455
Hedge trimmer, Klitsch & Thogode..... 914,731
Hedge trimmer, D. F. Roche, Jr..... 914,882
Heel building machine, A. M. Simmons..... 914,462
Hinge, A. Krauth..... 914,581
Hinge and article hanger, combined, H. G. Bryant..... 914,697
Hoisting attachment and cornice protector, J. H. Marvin..... 914,854
Hook, See Fish hook.
Horn, amplifying, C. Beecroft..... 915,013
Horse detacher, J. S. Williams..... 915,006
Horseshoe, C. Wernstrom..... 914,903
Horseshoe, A. F. Paulsen..... 914,971
Hot air register, C. K. Clark..... 914,791
Humidifying and air conditioning apparatus, S. W. Cramer..... 914,640
Hydraulic motor, J. G. McDowell..... 914,745
Igniter, Mantion & Stanley..... 914,964
Illuminator, V. R. Lausingsh..... 915,056
Index, L. L. Dennick..... 914,556
Indicator contact maker, helm, F. W. Wood..... 914,626
Insect trap, Heath & Martin..... 914,571
Insecticide, J. W. Lafer..... 914,430
Insole cleaning machine or device, J. F. Noonan..... 914,448
Internal combustion engine, A. L. Galusha..... 914,566
Invalid's supporter, E. I. Boyce..... 914,785
Iron cutter, W. R. Walker..... 914,620
Ironing board, A. Kennan..... 914,956
Ironing machine, H. G. Grasse..... 914,716
Ironing machine, G. L. Martin..... 914,965
Jar or bottle stopper, A. P. Lee..... 914,990
Joint chair, railway, D. C. Miller..... 914,533
Journal box lubricating device, J. G. Smith..... 914,524
Kinetoscope, J. Keller..... 914,729
Ladder, A. H. Loomis..... 914,436
Lamp, P. Heylandt..... 914,954
Lamp, arc, W. F. Warner..... 914,684