

RECENTLY PATENTED INVENTIONS.

Railway Appliances.

RAILROAD CROSSING.—DANE SCOTT, Delphos, Ohio. The purpose of this invention is to provide a railway crossing in which the pounding of the car and engine wheels at the crossing will be avoided. This is done by providing additional inside rails running parallel with the main rails and forming guideways in which are situated sliding blocks mounted on a suitable mechanism so that, as the train passes the crossing, the blocks may be raised to fill the spaces between the rails and thus provide additional bearing surface over which the treads of the wheels may roll.

RAILWAY SWITCH.—ERNEST P. NEWMAN, Stillwater, Minn. The invention consists of an automatic switch point capable of being shifted in either direction by a detent on a car striking an arm near the switch. The shifting mechanism consists of a grooved cam connected with suitable gearing. The switch point can be moved by a lever if operated manually, or it can be suitably connected and worked from a distance.

Agricultural Apparatus.

COLTER.—ARTHUR C. GAYLORD, Sandoval, Ill. The invention consists in the main in providing the colter wheel and colter fork with conical bearings, so that they can be more readily adjusted. An improved clamp for fastening the upright standard to the plow arm is also included in the patent.

COLTER CLAMP.—ARTHUR C. GAYLORD, Sandoval, Ill. This clamp consists of a circular plate provided with ears through which pass bolts that fasten it to the plow arm. The plate has a circular hole extending half way through it and having inclined, undercut edges. The base part of the clamping jaws, that hold the colter standard, is made to fit in this hole, and when the jaws are tightened around the standard, the base is automatically clamped in place in any desired position.

COTTON-SEED DROPPER.—WARREN SMITH, De Leon Springs, Fla. The dropper consists of a framework mounted on a sharp wheel for cutting the furrow, and having suitable handles attached to the seed dropping box on the rear. A small plow or track clearer is mounted in front of the furrowing wheel, and a cover blade fills in the furrow after the seed has been dropped. The seed box has a concave bottom with a slot in it, and a drum containing pockets, which is revolved under it by means of a chain connection with the furrowing wheel, drops the seed every few feet in the ground. A rotary stirrer in the seed box keeps the seeds from getting lumpy.

MACHINE SICKLE GRINDER.—EDDIE VILAS GREEN, Topeka, Kan. This invention consists of an attachment for mowing machines whereby a sickle may be ground quickly and automatically while the machine is at work in the field. The sickle is placed in a suitable holder which is capable of moving it forward one tooth at a time by operating a lever. The grinder is set in motion by a sprocket and chain connected with a countershaft at right angles to the axle of the machine, the countershaft being turned by a bevel. The grinder wheel is given a reciprocating movement from the point to the upper edge of the teeth by means of a connection of its pivoted supports with a wheel on the countershaft.

MOWING-MACHINE SICKLE GRINDER.—EDDIE VILAS GREEN, Topeka, Kan. This arrangement is an improvement on the foregoing grinder in that, instead of a reciprocating movement being given to the grinding wheel, this movement is given to the sickle blade itself. The blade is held in a rocker frame which is connected with a wheel on the countershaft by which it is given a reciprocating movement.

SPRAYING APPARATUS.—MARION L. JOHNSON, Mears, Mich. The sprayer consists of a chamber into which the liquid is drawn by the upstroke of a piston operated by a small windlass. A valve in the bottom of the chamber causes the liquid to be retained, and another valve in the tube leading to the spraying nozzle is kept closed till the apparatus is placed near the tree to be sprayed. When this valve is opened the piston is forced downward by a powerful coiled spring, and the operator has nothing to do but to direct the spray where it is needed.

Electrical Inventions.

TELEPHONE.—HENRY F. BLACKWELL and MAUDE A. BLACKWELL, 89 East Eighty-first Street, New York, N. Y. The object of this invention is to provide a small, compact instrument that may be carried in one's pocket and attached to a fire alarm system without impairing the circuit for fire alarm purposes. The telephone is placed in a neat box that may be hung on the open door of a fire alarm box and connected by flexible wires, plugs and sockets with the circuit. The primary is contained altogether in the telephone, except that its two ends run into the receiver, where they are connected at will by a push button. One end of the secondary is connected with the line and the other end, after passing through the receiver, runs through a condenser to the ground. Although the instrument is particularly adapted for the use of the fire department, it will also be found an accurate instrument for making capacity determinations, etc., in both underground and overhead lines.

Miscellaneous Inventions.

FIRFARM.—WALTER J. TURNBULL, New Orleans, La. The invention consists of a feeding device for a firearm in which a magazine or cartridge belt is employed, and the object of the inventor is to make such improvements as to enable the cartridge to be fed by the same device that operates the hammer. This device consists of a wheel with cam teeth which operates the hammer. The inner surfaces of the teeth are grooved so as to form shoulders to engage with wings formed on the cartridge carrier. The carrier is thus turned sufficiently to bring a fresh cartridge in registry with the barrel and hammer every time the trigger is pulled.

RIPPING TOOL.—WYLY R. APPELBY, Lowell, Ohio. The tool consists of two handles, like scissor handles, pivoted together near one end. The handles terminate in a suitable head-piece having a plow-shaped point at the bottom forward end. Just behind this point a cutter is situated in the head. The cutter has a forward

downward motion, and when operated by the shear handles rips a seam very rapidly, without in any way injuring the cloth.

TYPE-SETTING MACHINE.—CHARLES J. BOTZ, Sedalia, Mo. The machine comprises the following main parts: A casing containing a series of type channels, a movable type chute or transmitter, a composing slide, and a spacing and column-forming mechanism respectively. The type channels are arranged in a semi-circle and in several tiers. They are slightly tilted backward, and the type is pushed forward and into the chute by a ratchet-and-pawl pusher operated from the keyboard. The type chute is pivoted to move horizontally. It swings around the semi-circle and into place before the proper type-channel by pressing the corresponding key. A movable arm on the chute operates the pusher, which pushes forward the line sufficiently for a single type to fall into the chute and be delivered into the composing slide, where the types are formed into lines and spaced. The spacing and column forming, if not done by hand, is accomplished by two special attachments.

SPACING ATTACHMENT FOR TYPE-WRITERS.—ROBERT J. MINER, Greenwich, Conn. The attachment, which makes the proper spaces for tabulating accounts, consists of a series of fulcrumed space controlling blocks operated by special keys. A tappet is fastened to the carriage and the latter is stepped in the proper position by the blocks engaging the tappet. The carriage is provided with a swinging rack-bar which is lifted by a lever having its other end extending under the several blocks so that it can be moved by any of them. The raising of the rack by this lever allows the carriage to move onward till stopped by the tappet engaging the proper block.

WASHING MACHINE.—EDGAR LACHANCE, Pittsburg, Kan. The machine is constructed without the employment of rollers or shafts as rubbing surfaces for the clothes. It is horseshoe-shaped in cross section, having a corrugated lid similar to a washboard that closes the top. The machine has a perforated double bottom, so that when the machine is given a rocking motion by hand aided by springs, the heated washing fluid and steam will be forced through the clothes, thoroughly cleansing them without injury to the finest or most delicate fabric.

WEIGHING ATTACHMENT FOR TRUCKS.—GEORGE L. BANKS, Colorado Springs, Col. The attachment consists of a weighing platform mounted on two horizontal cross rods which are suspended on knife edges from the truck frame. The cross-rods are connected through lever arms by a connecting rod and coiled spring, as well as by connecting rods on each side. A pointer connected with the spring rod travels over an arc scale and registers the weight. When not in use, the weighing platform is kept in normal position by cams or other devices.

VEHICLE BODY.—FREDERICK MENZER, Flint, Mich. The object of the invention is to construct a second seat for buggies or sleighs that may be folded up when not in use. The body of the carriage is made long enough to allow of sliding the regular seat backward, after removing a folding box cover which normally closes the rear end. A folding seat and back is then raised and held in place by braces.

KILN OR FURNACE.—JAMES O'CONNEL and BENJAMIN F. HILLERY, 640 West 131st Street, New York, N. Y. The invention consists of a boiler to be set in the arches of kilns or furnaces, and utilizes the steam generated to increase combustion. The boiler is an annular chamber having a steam dome and containing a circular firebox within it. The firebox is closed at the rear end by a fire wall extending upward about two-thirds of the height of the box and by a damper hinged to the back of the wall and closed from the outside by a wheel. When the damper is closed, the products of combustion are entirely shut off from the central or burning chamber of the kiln, thus enabling a person to work in this chamber even when fire is in the furnaces surrounding it. A steam spray pipe is arranged under the grate, and the spray of steam tends materially to increase combustion.

METHOD OF FORMING DIES.—HENRY F. BLACKWELL, Jr., 99 East 81st Street, New York, N. Y. In making the die, an electrotype is first made of the article to be reproduced. The intaglio of the electrotype is then filled with a supporting compound and a composite backing is formed by surrounding the electrotype with an iron cylinder and pouring in molten metal. The electrotype and supporting compound are then removed and the die is finished off in a lathe.

HEEL-RUBBER.—JOHN H. MORROW, Chicago, Ill. This invention consists of a rubber heel casing made to fit over the heel of a shoe or boot to prevent the wearer from slipping when walking on icy sidewalks. The rubber is slit in the back at the top, and the two parts are fastened together by a button and socket or other fastening device.

Designs.

CATTLE SHED.—WILLIAM HEATON, "Big Box," Allerton, Ill. The design consists of a simple shed with a long section of sloping roof running from an apex to the back side wall. The framework of the entrance end inclines outward slightly from its base, and its upper end is connected with the main roof by a short slant-roof which makes an apex with the former. Horizontal cross beams connect the back end with the front, thus forming a left in the upper part of the shed, and the whole framework is strongly braced. A plan view of the shed shows it to be in segmental sections in the shape of a keystone, so that a number of these sections placed together will form a curved or circular shed.

ABDOMINAL BANDAGE.—DANIEL D. McCLOURE, Portland, Oregon. The bandage consists of a Y-shaped front piece fastened upon a main body portion which tapers at each end to narrow bands that pass around the waist and are fastened in front to the end of each branch of the Y. The main body portion is also tapered downward into straps that pass around the legs and are fastened to the bottom of the Y side by side.

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.

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue.

- Marine Iron Works. Chicago. Catalogue free.
For logging engines. J. S. Mundy, Newark, N. J.
"U. S." Metal Polish. Indianapolis. Samples free.
Gasoline Brazing Forge, Turner Brass Works, Chicago.
Yankee Notions. Waterbury Button Co., Waterbury, Ct.
Handle & Spoke Mch'y. Ober Mfg. Co., Chagrin Falls, O.
Machinery designed and constructed. Gear cutting. The Garvin Machine Co., Spring and Varick Sts., N. Y.
Ferracute Machine Co., Bridgeton, N. J., U. S. A. Full line of Presses, Dies, and other Sheet Metal Machinery.
The celebrated "Hornsey-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Refrigerating Machine Company. Foot of East 138th Street, New York.
The best book for electricians and beginners in electricity is "Experimental Science," by Geo. M. Hopkins. By mail, \$4. Munn & Co. publishers, 361 Broadway, N. Y.

Send for new and complete catalogue of Scientific and other Books for sale by Munn & Co., 361 Broadway, New York. Free on application.



HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters. No attention will be paid thereto. This is for our information and not for publication.
References to former articles or answers should give date of paper and page or number of question.
Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.
Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.
Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.
Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(7711) I. H. asks: 1. Can paper be treated chemically so that a current of electricity will turn it a different color if sent through it? I am told that printing telegraphs employ this method. A. Chemically prepared paper for autographic and automatic telegraphy is prepared by soaking it in either of the following solutions: Nitrate of ammonia, 2 pounds; ferricyanide of potassium, 1/2 ounce; gum tragacanth, 2 ounces; glycerine, 2 ounces; water, 1/2 gallon. Or, iodide of potassium, 1/4 pound; bromide of potassium, 1 pound; starch, 1/2 ounce; water, 2 quarts. 2. How is the paper prepared?

- A. Iodide potassium, 1/4 lb.
Bromide potassium, 2 lb.
Dextrine or starch, 1 oz.
Distilled water, 1 gal.

(7712) Reader asks what it would cost to purchase if you could furnish same, a complete file of the SCIENTIFIC AMERICAN, covering the last twenty-five years, either bound or unbound. Also cost of same for longer period, say thirty, thirty-five, or forty years, and also tell how long the paper has been published. Would it be possible to obtain a complete file at any price? Would not such file make a very perfect library in itself of scientific invention and facts covering the period of its publication? Please answer in your next issue. A. If "Reader" will give his name and address we shall be glad to quote price of volumes for last ten years which is all we can supply. Possibly some of our subscribers may have partial or complete sets, if so, we shall be glad to give "Reader" their price. A set would indeed make a library and would show the progress made in the fifty-three years the SCIENTIFIC AMERICAN has been published.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Issued for the Week Ending AUGUST 15, 1899.

AND EACH BEARING THAT DATE.

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

- Adding machine, J. O. Long, 630,904
Alarm, See Electric alarm.
Alarm, L. Schiff, 631,230
Alarm device, Brumder & Roginger, 630,857
Aligning and leveling device and method, J. V. Hulse, 631,114
Aluminum, reducing, F. A. Gooch, 631,233
Animal tail holder, G. W. Noland, 630,929
Anti-racks, machine for making, M. E. Biersack, 630,845
Apron fastener, H. K. Custer, 631,005
Armature, H. G. Reist, 630,939
Awning, J. Delorieux, 631,065
Ax handle, W. S. Marsh, 631,117
Axle attaching device, vehicle, A. Levedahl, 631,018
Axle lubricator, car, H. Gallagher, 631,210
Axle skein, roller bearing, A. H. Wood, 630,961
Back band hook, S. Ward, Sr, 631,190
Back pedaling brake, A. C. Hendricks, 631,011
Badge holder, J. P. Schlage, 630,934
Bar, See Sickle bar.
Bars, machine for lifting and conveying straightened, R. W. Lundy, 631,084
Battery cell, storage, A. K. Westerdahl, 631,191
Bearing axle, A. J. Theuring, 630,948
Bearing dust cap, A. Sidwell, 631,054
Bearing, roller, A. Levedahl, 631,018
Bearings, cone lock for ball, F. Myers, 630,918
Bed bottom, spring, C. D. Brouette, 630,968
Bicycle, R. F. Darling, 631,063
Bicycle saddle, J. D. Moore, 630,911
Blower, steam, C. S. Farrer, 631,007
Board, See Wagon grain board.

- Boat lowering apparatus, A. Des Fours, 631,066
Boat lowering appliance, F. R. Patey, 631,226
Boiler, See Steam boiler.
Boiler, screw, removable steam, E. R. Williams, 631,100
Bolster, meta, A. B. Bellows, 631,246
Book leaf, H. G. Razall, 631,127
Book, manufacturing sales, C. L. Denison, 631,107
Boring machine, Lowell, A. E. Woods, 630,963
Bottle, non-refillable, G. McEachron, 631,258
Bottle, non-refillable, J. F. Gaylord, 631,252
Bottle, non-refillable, F. D. Ray et al., 630,929
Bottle, non-refillable, H. Seelinger, 631,183
Bottle shield or protector, H. Seelinger, 631,182
Bottle stopper, J. P. Erie, 631,088
Bowling alley, W. F. Mussey, 631,090
Box handle, A. S. Hall, 630,884
Box or crate, P. C. Leidich, 630,943
Boxes, cans, etc., means for extracting articles from them, F. King, 631,078
Bracket, See Fence post bracket.
Brake, See Back pedaling brake. Rudder brake. Track and wheel brake. Vehicle brake.
Bricks, etc., apparatus for drying, O. Howl, 631,214
Bridge, draw, Franson & Wilman, 630,879
Brush, F. W. Barratt, 630,844
Brush, collapsible tube, J. A. Symonds, 631,000
Buckle, slide, A. Lanau, 631,082
Buckle, trace, J. Van Vriesland, 631,082
Buggy best fastener, W. W. Kneisly, 630,898
Buggy top window and curtain, J. Schmeer, 630,991
Bulletin, E. S. Brooks, 630,855
Burial casket trimming, H. T. Loomis, 631,116
Burner, See Hydrocarbon burner. Lamp burner.
Burners, oil supply system for, S. L. Jones, 631,077
Button, F. Hornmann, 631,212
Button, H. Kinemann, 631,216
Button, link cuff, H. V. Johnson, 631,215
Cabinet, blank, G. H. Megquier, 631,237
Cam, See Creaming can.
Car bolster, Kennedy & Scaife, 630,896
Car brake system, street, T. Reilly, 631,282
Car, cinder dumping, J. J. Gorman, 631,071
Car controlling mechanism, electric railway, S. H. Short, 630,839
Car coupling, A. L. Ellinger, 631,087
Car door fastener, Phillips & Hogan, 631,051
Car seat, G. W. Dryer, 631,204
Car wheel, ball bearing, F. Myers, 630,914
Carbide furnace, L. K. Bohm, 630,946
Carburetor, A. J. Van Vriesland, 631,082
Carding engine, J. R. Marsden, 631,022
Cartridge, W. C. Lynnham, 631,085
Cash register, J. Pallweber, 630,922
Cash register counting or adding mechanism, G. Schuster, 631,231
Casting waste to train, mould for, P. D. Hay, 631,084
Center, A. H. Bromley, Jr., 631,105
Chain, E. D. Fack, 630,978
Chair, See Nursery chair.
Chair, A. H. Pimock, 631,176
Check perforating apparatus, J. D. Baumann, 631,286
Chip separator, Richards & Brewster, 631,057
Chocolate, machine for making, J. W. Lehr, 631,021
Chopping or mincing knife, J. W. Lehr, 631,021
Churn, J. W. Macey, 631,171
Clamp, See Rope clamp. Self-locking clamp.
Clamping device, string, H. E. Waterbury, 631,058
Classifying lists of names, means for, T. C. Massey, 630,835
Cleaner, See Cotton cleaner.
Cleansing apparatus, W. A. Schmidt, 631,180
Closet, See Water closet.
Cloth into predetermined lengths, machine for cutting, C. H. Crowell, 630,863
Cloth shearing machine, cloth, H. E. Waterbury, 630,863
Coatings to structures, apparatus for applying antifouling, G. D. Coleman, 631,154
Cock and igniting device, electrically operated, P. L. Guyenet, 631,162
Cock, sink and basin, H. Sieben, 630,940
Cock, stop and lock, H. Sieben, 630,940
Concentrator, Reese & Hyatt, 630,899
Cooler, See Milk cooler.
Copying apparatus, H. Kranz, 630,901
Cord ball holder, A. Weinberg, 631,141
Corn on the cob, implement for shelling green, R. M. Paces, 631,259
Cornstalks, machine for removing pith from, G. R. Sherwood, 631,166
Corset, D. Keps, 631,079
Cotton beater safety device, Ward & Curtis, 631,144
Cotton cleaner and feeder, E. L. Smith, 631,030
Couch, E. M. Bond, 630,967
Coupling, See Car coupling. Union coupling.
Coupling, E. Haber, 630,882
Cradle, self-rocking, J. Josefowicz, 630,894
Crate, shipping, A. E. Hinman, 631,075
Crating or packing can stock, apparatus for, W. H. Seal, 630,837
Creaming can, Laube & Kinney, 631,218
Cultivator shovels, automatic spring trip for, W. Sobey, 631,232
Curling iron heater, J. R. Hoyt, 630,879
Cutter, See Stalk cutter.
Cutting, folding, and pasting machine, E. P. Sheldon, 630,837
Cycle saddle and support, A. J. Morrison, 630,912
Deborner, T. F. Norris, 631,123
Depository, mechanical, M. C. Mengis, 631,024
Digger, See Pest hole digger.
Disinfecting, R. Reeves, 631,228
Disk drill, W. Stephenson, 631,135
Disk, C. M. Bond, 630,967
Door check, C. F. Hanington, 631,074
Door time check, C. C. Bieltz, 631,034
Dough mixing machine, C. A. Conner, 630,891
Draught equalizer, M. Gentry, 630,880
Drier, See Sickle bar.
Drill, See Disk drill.
Drying and heating appliance for laundries, etc., C. C. Barbour, 631,061
Dye and making same, red, C. O. Muller, 631,089
Dye and making same, substantive sulfur, H. R. Vidal, 630,952
Electric alarm and registering or controlling apparatus, M. Vester, 631,032
Electric currents, automatic regulator for, A. Vogt, 630,953
Electric light controller, O. M. Lacey (reissue), 117,675
Electric meter, C. Packard, 631,225
Electric safety appliance, Badger & Plews, 631,145
Electric wiring cleat, H. M. Stevens, 631,244
Electrician's tool, D. S. Geiser, 631,112
Elevator, See Safety elevator.
Engine, See Carriage engine. Gas engine. Gas or oil engine. Rotary steam engine.
Engine, J. R. George, 630,881
Engines, apparatus for starting internal combustion, Edmonds & Dawson, 631,206
Exhibitor, silk skein, L. Levinson, 631,053
Eye strengthener, E. B. Carter, 630,859
Eyeglasses, R. J. Lines, 631,170
Fan and churn, combined, J. C. Foreaker, 630,877
Fence machine, N. A. Fielder, 630,975
Fence post, A. N. Sharrack, 631,131
Fence post bracket, H. W. Timmons, 631,138
Fifth wheel, K. Thoma, 631,193
Filter, H. Reiser, 630,888
Filter, gravity water, D. J. Bliss, 630,946
Filter, rain water, W. M. Ricketts, 631,128
Filter, universal, K. Abraham, 631,143
Filtering apparatus, V. C. Driesbach, 630,870
Filtering device, J. Wilson, 630,892
Fire escape, J. Laming, 630,802
Fire escape, M. K. McGowan, 631,174
Fire escape, J. Y. Shallenberger, 630,983
Fireproof chimney, F. H. Urban, 631,139
Fire pumps, apparatus for automatically insuring periodic operation of stationary, Clark & Gimby, 630,866
Fishing line tie at A. Bourke, 631,197
Flushing apparatus, R. A. Merrill, 631,025
Frame, See Vehicle frame.
Funnel, automatic, C. W. Wurster, 630,965
Funnel, incating, Treibel & Nier, 631,058
Furnace, See Carbide furnace. Smoke consuming furnace.
Furnace, W. McClave, 630,916
Furnace generator, steam boiler, J. O. Morris, 631,120
Gambrel, F. Schnell, 630,835
Game, J. Edwards, 631,114
Game apparatus, C. G. Burns, 631,050
Game, solitaire, J. Peck, 631,050
Garment hanger, Bigsby & Cross, 631,027
Gas and vapor burning device, combined, R. Thayer, 631,061
Gas burners, igniting device for, C. L. Burger, 631,216
Gas engine, C. P. Blake, 631,094
Gas engine, R. Sr. & R. Nuttall, Jr., 630,924
Gas generator, M. L. & W. D. Warner, 630,955
Gas generator, acetylene, G. Dawson, 630,875
Gas generator, acetylene, Demaria & Ranzi, 631,158
Gas generator, acetylene, W. H. Eldredge, 631,183
Gas machine, acetylene, Hasler & Prosser, 631,213
Gas or oil engine, Anderson & Ericksson, 630,838
Gas pipe or tubing, canopy for, G. D. Sherwin, 631,180
Gas producer for metallurgical plants, E. C. Hegeler, 630,885
Gas reports, apparatus for removing graphite crusts from, A. K. Ferris, 630,897
Gas to burners, etc., electric appliance for controlling supply of, C. Franzen, 631,037
Gate, C. Steel, 631,187

(Continued on page 142)

The New System OF EDUCATION
Mechanical Engineering
 Electrical, Civil and Mining Engineering; Drawing; Surveying; Chemistry; Plumbing; Architecture; Bookkeeping; Shorthand; English Branches
TAUGHT BY MAIL.
 Over 50 Courses.
 We have helped thousands to better positions and salaries. Send for free circulars, stating the subject in which you are interested.
THE INTERNATIONAL CORRESPONDENCE SCHOOLS,
 Box 942, Scranton, Pa.


Roper's New Engineer's Handy-Book
 for STEAM ENGINEERS and ELECTRICIANS.

Thoroughly revised, rewritten and much enlarged by EDWIN R. KELLER, M. E., and CLAYTON W. PRKE, B. S., Ex-President of the Electrical Section of the Franklin Institute. Embracing all the recent improvements in the Steam Engine and giving full instructions for the CARE and MANAGEMENT of an ELECTRICAL PLANT. Nearly 900 pages, 225 illustrations, over 700 main subjects, 222 tables, and 645 questions most likely to be asked when under examination before being licensed as an engineer. Full leather, gilt edges, pocketbook style, \$3.50. **DAVID McKAY, Publisher,** 1622 Market St., Philadelphia, Pa. Send for Circular.

"American-Hunnings" TELEPHONES.

Transmitters, Magneto Bells and Telephone Switchboards. Over 200,000 of our telephones in successful operation. Used by War and Navy Departments. In ordering state length of line, whether single line or metallic circuit and number of telephones to be used on one line. Send for catalogue "S. A." **AMERICAN ELECTRIC TELEPHONE CO.,** 173 South Canal St., Chicago, Ill.

THE NEW BRISTOL COUNTER



Registers an accurate account of work done on printing presses, grain tallies, weighing, measuring and other automatic machines. Counts up to 1,000,000 and repeats automatically. Simple, accurate, durable. Special counters to order. Send for circular. **C. J. ROOT, Bristol, Conn., U. S. A.**

This beats Wind, Steam, or Horse Power. We offer the **WEBSTER** 1/4 actual horsepower **GAS ENGINE** for \$150, less 10 per cent discount for cash. Built on interchangeable plan. Built of best material. Made in lots of 100 therefore we can make the price. Boxed for shipment, weight 800 lbs. Made for Gas or Gasoline. Also Horizontal Engines, 4 to 30 H. P. **WEBSTER MFG. CO.,** 1074 West 15th St., Chicago. Eastern Branch: 38-D Dey Street, New York City. Southern Branch: 207 Canal St., New Orleans, La., St. Peter and Lafayette Sts., New Orleans, La.

THE "HOGGSON" POCKET TIME STAMP
 Prints Year, Month, Day, Hour and Minute. Correctly timing every act, operation or transaction. Watchman and Employer's register, general time and check system, an absolute necessity in every business. Air cushion base. Operated without pounding. Complete with die and ink ready for use. Guaranteed for perfect work and correct time, or money refunded. **27 Thames St., N. Y.**

TELESCOPES
 SEND FOR CATALOGUE
W. & D. MOGEY,
 BAYONNE CITY, N. J.

The Pipe of the Century
 ...THE... **"MALLINGKRODT" PATENT**
NICOTINE ABSORBENT AND VENTILATED SMOKING PIPE, IS THE ONLY PIPE FIT FOR A GENTLEMAN TO SMOKE.
 Bowls of the Best French Brier, exceedingly neat and graceful in appearance, and cost no more than an ordinary pipe. There are no filthy stems to clean, and by a simple and effective construction, the poisonous nicotine juices are thoroughly absorbed before reaching the mouth, and a cool, clean and healthy smoke thereby assured. Money refunded if not satisfactory. Over 100,000 sold in 1898 alone. Send for illustrated circular "S. A." and prices.
THE HARVEY & WATTS CO.,
 275 Canal Street, N. Y. Station E, Philadelphia.

THE ONLY CAMERA FOR ALL PURPOSES
 \$5 TO \$50. PURPOSES. SEND TO **ROCHESTER OPTICAL CO.** IS **THE DREMO CAMERA**
 30 SOUTH ST. ROCHESTER, N.Y.

Automobiles
 The SCIENTIFIC AMERICAN for May 13, 1899, is devoted mainly to illustrations and detailed descriptions of various types of horseless vehicles. This issue also contains an article on the mechanics of the bicycle and detailed drawings of an automobile tricycle. Price 10 cents.
 The following copies of the SCIENTIFIC AMERICAN SUPPLEMENT give many details of Automobiles of different types, with many illustrations of the vehicles, motors, boilers, etc. The series make a very valuable treatise on the subject. The numbers are: 732, 973, 983, 1053, 1055, 1056, 1057, 1058, 1059, 1075, 1078, 1080, 1082, 1083, 1089, 1100, 1113, 1122, 1178, 1195, 1199, 1206, 1210. SUPPLEMENT No. 1229 contains a highly interesting article giving full data as to operating costs of horse and electric delivery wagons in New York City. Price 10 cents each, by mail. For sale by all newswriters or address
MUNN & CO., Publishers,
 361 Broadway, New York.

Turret, H. P. Hurst.....	630,889
Type holder, W. A. Fenn.....	630,873
Type mould, E. C. McFarland.....	630,917
Typewriter, S. Anderson.....	631,144
Typewriter, cipher graph, A. Böttger.....	630,848
Typewriters, carriage shifter and line spacer for, J. M. Cramer.....	631,155
Umbrella carrying device, S. McCrae.....	631,172
Union coupling, A. E. Dart.....	631,064
Unloading apparatus, W. A. & E. Ropp.....	631,129
Valve, J. F. Batchelor.....	631,146
Valve, J. Thummel.....	630,949
Valve, electrically operated gate, L. E. Walkins.....	631,203
Valve mechanism for engines, J. F. Mowatt.....	631,206
Valve, reversible check, G. M. Crum.....	631,036
Vehicle brake, F. P. Eddy.....	630,871
Vehicle frame, motor, H. Eastman.....	630,876
Vehicle spindle attachment, O. F. Skinner.....	630,995
Vehicle standard, T. R. Carskadon.....	630,858
Velocipedes, etc., path for driving chains of, B. Ljungstrom.....	631,219
Vending apparatus, coin operated, M. B. Mills.....	631,119
Ventilator, F. P. Hayes.....	631,042
Vessel, non-refillable, A. Shaoklet.....	630,892
Vise, C. J. Jackson.....	631,013
Vise, quick action, C. B. Campbell.....	631,151
Voltaic cell, standard, R. O. Heinrich.....	631,044
Voting machine, A. Gattrell.....	631,251
Wagon body hoisting and unloading device, R. Ege.....	630,872
Wagon grain board, G. S. Warren.....	630,856
Washer. See Glass or bottle washer.	
Watch balance, compensation, A. Borel.....	631,103
Water closet, Solomon & Van Leaven.....	631,097
Water heater, T. Pattison.....	631,261
Wave power, apparatus for utilizing, T. Reed dink.....	631,178
Weather signal indicator, T. A. & H. B. Froehlich.....	631,161
Weaving coil-yarn mats, machine for, K. Walker.....	630,954
Weeding tool, J. J. Stout.....	630,946
Weighing machine, F. H. Richards.....	631,052
Well drilling tool bar, H. W. Rank.....	631,177
Wheat drier, A. Johnson.....	630,892
Wheel. See Fifth wheel.	
Whiffletree hook, H. H. Allen.....	630,836
Window, A. Klein.....	631,123
Window glass, illuminating, C. E. Manning.....	631,229
Wire winding machine, G. F. Matteson.....	630,907
Wrench. See Pipe wrench.	
Wrench, J. Beeby.....	631,148
Wrench, J. L. Nott.....	630,986
Yoke, neck, R. F. King.....	631,264

DESIGNS.

Badge, C. G. Willson.....	31,387
Bottle stopper extractor, G. Koeh.....	31,388
Can bottom, H. M. Case.....	31,399
Chair spindle, J. Gilson.....	31,416
Cupidor, pocket, F. D. Phelan.....	31,397
Engines, cylinder head for triple cylinder, C. L. Mayhew.....	31,412
Engines, cylinder piece for triple cylinder, C. L. Mayhew.....	31,411
Entry sheets, skeleton frame for, H. Swalley.....	31,392
Envelope blank, J. H. Bradley.....	31,421
Fan for sewing machines, A. Weinraub.....	31,405
Game board, V. W. Wilson.....	31,419
Game frame, V. W. Wilson.....	31,418
Hat box, H. A. Dekay.....	31,402
Hat lining, F. Mack.....	31,424
Ice creaser, G. W. Brown.....	31,423
Lamp burner, C. K. Harding.....	31,406
Licorice stick, C. A. Smyle.....	31,389
Lunch box, bicycle, J. Algotz.....	31,403
Match box, L. Fritzsche.....	31,400
Match box or similar article, W. H. Barbour.....	31,401
Medal, E. R. McMaster.....	31,388
Mouthpiece, J. J. Geraghty.....	31,395
Necktie holder, D. Haslup.....	31,394
Nozzle member, spraying, E. Allier.....	31,408
Photographic mats or mounts, border for, E. Carraile.....	31,393
Rail brace and pinning, J. Geraghty.....	31,417
Refrigerator, Young & Thompson.....	31,417
Ruler, T. Williams.....	31,390
Saddle pad, T. Padgett.....	31,409
Skirt facing and binding, A. M. Weber.....	31,424
Slipper, H. P. Kinsland.....	31,422
Speculars, supporting member for vaginal retractor, C. Filling.....	31,396
Stove, gas, J. H. Diamond.....	31,413
Stove or range, W. L. Mersfelder.....	31,414
Switch button, snap, C. G. Perkins.....	31,410
Tread, pneumatic, W. G. Huber.....	31,404
Toy car motor, C. K. Harding.....	31,420
Vapor burner frame, C. F. Best.....	31,420
Waist, S. Floersheimer.....	31,425

TRADE MARKS.

Brushes, certain named, C. A. Kirkwood.....	33,355
Butter, H. S. Cannon.....	33,378
Cartridges and primors, smokeless powder, Union Metallic Cartridge Co.....	33,358
Chemical, pharmaceutical, surgical, dietetic, and cosmetic products and preparations, Lichtyol Gesellschaft, Cordes, Hermann & Company.....	33,363 to 33,374
Coffee, F. G. Alden.....	33,374
Cosmetics, Dr. J. Parker Pray Company.....	33,352
Cotton goods, Ely & Walker Dry Goods Company.....	33,352
Dentifrices, C. A. Kirkwood.....	33,356
Effervescent powders, Kutnow Brothers.....	33,372
Filters and filtering apparatus, H. Nordtmeier.....	33,387
Finger nail polish, Dr. J. Parker Pray Company.....	33,357
Flour, wheat, H. B. Smith.....	33,376
Gum, chewing, L. Loy.....	33,371
Leather, canvas, and rubber boots, shoes, and slippers, F. A. Seavey.....	33,353
Lotions, eye, Ophthalmic Remedy Company.....	33,360
Medical preparation for certain named diseases, Creed & Green.....	33,367
Medicine, certain named proprietary, O. Lillybeck.....	33,366
Medicine, tonic, L. R. Baridon.....	33,369
Ointment for certain named diseases, Dermatoplasma Company.....	33,370
Pianoforte strings, R. C. Koch.....	33,386
Remedy for seasickness, certain, J. G. J. Mummel.....	33,368
Rubber shoes, certain named, Joseph Banigan Rubber Company.....	33,354
Soap for polishing silverware, A. M. Morrison.....	33,384
Solvents for gums and oils, chemical, Commonwealth Manufacturing Company.....	33,385
Sugar and sirup, maple, A. A. Low.....	33,382
Sugar, maple, A. A. Low.....	33,379
Surgical bandages, Brion, Pate, Burke & Company.....	33,362
Syringes and water bottles, fountain, V. C. Vant.....	33,361
Wood, W. D. Wood.....	33,383
Textile materials, cleaning compound for, J. Fitzgerald, Jr.....	33,383
Toilet preparation, certain named, Dr. J. Parker Pray Company.....	33,358
Vehicles, automatically propelled, "Locomobile" Company of America.....	33,389
Wines, Wein Company "Kloster Ley".....	33,373

LABELS.

"Bengal," for cotton goods, S. A. Crozer & Son.....	7,084
"Columbian Cream Bread," for bread, cake, etc., J. G. Meinberg.....	7,087
"Heallo," for a salve, W. Goodsell.....	7,094
"Herbal-tea," for a medicine, T. J. Cummines.....	7,083
"Natural Bartlett Pears," for canned goods, United States Printing Company.....	7,090
"Natural Green Gages," for canned goods, United States Printing Company.....	7,089
"Natural Peaches," for canned goods, United States Printing Company.....	7,088
"Polar Queen," for cigars, American Lithographic Company.....	7,085
"Takanap," for soap, Thayer-Milne Company.....	7,082
"Turtle Club," for cigars, B. Simons & Company.....	7,086
"Whitar," for soap, Clinton Soap Company.....	7,081

PRINTS.

"Dreydoppel's Lock," for soap, M. D. Wood Printing Company..... 158
 A printed copy of the specification and drawing of any patent in the foregoing list, or any patent in print issued since 1883, will be furnished from this office for 10 cents. In ordering please state the name and number of the patent desired, and remit to Munn & Co., 361 Broadway, New York. Special rates will be given where a large number of copies are desired at one time.
 Canadian patents may now be obtained by the inventors for any of the inventions named in the foregoing list, provided they are simple, at a cost of \$40 each. If complicated the cost will be a little more. For full instructions address Munn & Co., 361 Broadway, New York. Other foreign patents may also be obtained.



292 Pages of Reading
224 Illustrations
18 Separate Articles
PRICE... 50 Cents

THE ELECTRIC RAILWAY NUMBER
CASSIER'S MAGAZINE
 THE GREAT ENGINEERING MONTHLY

CONTENTS
 Electric Conduit Railways F. S. PEARSON
 Electric Tramways in Great Britain ROBERT W. BLACKWELL
 Building an Electric Railway LEMUEL W. SERKELL
 Overhead Construction J. G. WHITE
 The Development of the Modern Electric Railway Motor DR. CARY T. HUTCHINSON
 Some Early Traction History THORBURN REID
 Electrolysis from Railway Currents A. V. ABBOTT
 The Municipal Ownership of Tramways in Great Britain BENJAMIN TAYLOR
 The Development of the Street Car JOHN A. BRILL
 Rails and Rail Joints M. K. BOWEN
 Light Electric Railways DR. LOUIS BELL
 The Multiple Unit System for Electric Railways FRANK J. SPRAGUE
 The Electric Locomotive GEORGE R. MAIR
 Polyphase Alternating Currents for Electric Railways Prof. DUGALD C. JACKSON
 The Selection of Rolling Stock C. F. UEBELACKER
 Storage Batteries and Electric Railways HERBERT LLOYD
 Electric Railways in America WILLIAM J. CLARK
 The City and South London Electric Railway P. V. MCMAHON

Cassier's Magazine is the acknowledged authority on Engineering, Electrical and Marine subjects. 300 of the greatest engineering experts of the world are among its contributors. If you subscribe now, \$3.00 for one year, \$1.50 for 6 months, we will include this number without extra charge.

THE CASSIER MAGAZINE CO., 3 WEST 29th STREET, NEW YORK
 Foreign orders supplied at 2 Shilling and 6 Pence, post free, by The Louis Cassier Co., Ltd., 33 Bedford Street, Strand, W.C., London, Eng.; 23 Esplanade Road, Bombay, India; 61 Main Street, Yokohama, Japan; and 124 Queen Street, Melbourne, Australia.

MODELS for inventors. Estab. 1867. Catalogue. J. C. SEYL, 181 Madison St., Chicago.
 Dies with paralyzed edges last five times longer. Make smooth work. Ernst, 765 Summit Ave., Jersey City, N. J.
WANTED. A number of Mechanical and Electrical Moving Figures, Pieces and Novelties for Window Displays. New or second-hand. Only high-class novel and attractive features desired. BIXBY WILLIS, 1111 Walnut St., Kansas City, U. S. A.
A LARGE FACTORY, close to Boston, equipped with best makes of machinery: Drop Hammers, Lathes, Planers, Polishing, Plating, Enameling Depts., Hardening and Annealing Furnaces. Suitable for the manufacture of Automobiles. Would like to figure on whole or parts of motor vehicles. Address Confidence, Sci. Am.

GAS ENGINE WANTED-5 to 12 H. P. May be worn out, as only certain parts are desired. SEYMOUR AYRES, 1006 Johnson Street, Bay City, Mich.
ICE MACHINES, Corliss Engines, Brewers' and Bottlers' Machinery. THE VILBER MFG. CO., 839 Clinton Street, Milwaukee, Wis.

TURBINES Send for Circular "M." **JAS. LEFFEL & CO.,** Springfield, Ohio, U. S. A.

Brass Band
 Instruments, Drums, Uniforms & Supplies. Write for catalog, 445 illustrations. FREE! It gives Music and Instructions for New Bands.
LYON & HEALY, 58 Adams St., CHICAGO.

Monitor
 MARINE VAPOR ENGINES.
 SIXTH YEAR NEW MODEL UP TO DATE.
 GEORGE W. MONITOR, GRAND RAPIDS, MICHIGAN.

50 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 newswriters.
MUNN & Co., 361 Broadway, New York
 Branch Office, 625 F St., Washington, D. C.

INVENTIONS WANTED
 Wanted a Design for a Blacksmith Hand Blower to be manufactured on royalty. This blower must have a positive blast and be an improvement upon those now on the market. J. Nehl, Main & Dock Sts. St. Louis, Mo.
To INVENTORS and MANUFACTURERS
 Persons controlling patents for railway appliances of recognized merit for track signalling or rolling stock, desiring to have them manufactured and introduced in Great Britain or British possessions in South Africa, India, and Australia, or in Egypt, can make favorable arrangements with a long established British manufacturer of such appliances, well known to railway managers in those countries. Address B. D. HASELL & CO., 66 Pine Street, New York.

YOU CAN MAKE \$100 A WEEK!
 Own Your Own Show Complete Outfit-\$100.
LIFE MOTION FILMS & MACHINES
 GREAT PASSION PLAY & 500 OTHER SUBJECTS
 ILLUSTRATED CATALOGUE
S. LUBIN, LARGEST MFR. PHILADELPHIA P. A.

Cement Property for Sale.-The most desirable property in the State of New York for the establishment of an extensive Portland Cement Plant. An inexhaustible quantity of rock and clay of the best quality. Very desirable shipping facilities by railroad and canal. Address, H. McKie Wing, Glens Falls, N. Y.

Planning the New Home
 Anyone contemplating the building of a new home will find the Building Edition of the Scientific American of peculiar and absorbing interest. This beautiful publication is issued monthly, and contains practical articles and suggestions on modern house building, together with a series of splendid plates, showing perspective views and floor plans of the most up-to-date modern dwellings, estimated cost, etc. A single issue of this handsome periodical is often worth the year's subscription price to the intending builder. Write to-day and send 25 cents for a single copy, or \$2.50 for annual subscription.
MUNN & CO., Publishers, 361 Broadway, New York.

