

## ENGINEERING INVENTIONS.

A feed water purifier has been patented by Messrs. George W. Allen, of Manchester, England, and Henry J. A. Bowers, of Acton, London, England. It has a scum plate for collecting impurities thrown to the surface by ebullition, there being a trough between the scum plate and feed pipe to collect the heavier as well as the lighter impurities to an external separator.

A boiler tube cleaner has been patented by Mr. George M. Robinson, of Baltimore, Md. It has a steam inlet pipe carrying a fixed valve, a cylinder being adapted to slide on the steam inlet pipe and having a cone fitting into the tube to be cleaned, the tubes being cleaned by the action of steam passing through the cleaner and directed to the inner surfaces of the tubes.

The utilizing of gas explosions as a motive force forms the subject of a patent issued to Mr. Thomas H. Bolmer, of New York City. The apparatus has an explosion chamber with pipes and valves for introducing an explosive material, igniting connections, and tubes through which the liquid used in transmitting power is admitted and ejected, the apparatus being designed to be applicable to the propelling of vessels, pumping, etc.

A piston has been patented by Mr. Amos M. Morrill, of Ravenna, Mo. The piston head consists essentially of outer expandable rings and an inner expandable ring arranged in connection therewith, spring heads being mounted in connection with the expandable rings, and a bolt arranged for connection with the piston rod, followers and flat or spiral springs being dispensed with, while the piston rod is accurately centered.

## AGRICULTURAL INVENTIONS.

A listing plow or cultivator has been patented by Mr. Joseph S. Crum, of Stockdale, Kan. This invention provides a construction which can be readily connected to an ordinary cultivator frame, and adjusted at the connection to regulate the depth of the plows or shovels, the device being simple and efficient.

A potato digger has been patented by Mr. Peter A. Chippendale, of Lewiston, Me. It has a scoop plow adapted to be raised and lowered to suit the depth of the row, in connection with a novel construction of endless chain upon which the potatoes and earth are delivered, and in the operation of which the potatoes are separated and transferred to a bag.

## MISCELLANEOUS INVENTIONS.

A stirrup attachment has been patented by Mr. Jacob G. Welcome, of Fort Bidwell, Cal. It is especially designed for use by constant riders, such as stockmen, etc., to impart an easy motion, and is so made as to detach itself from the saddle if the rider is thrown.

A measuring reel has been patented by Mr. Enos M. Thomas, of Cherry Grove, Pa. It is mounted on a fixed shaft, with friction washers, a feathered disk and handled nut, the reel having a registering attachment, and being more especially designed for use in lowering torpedoes into oil wells.

A milk gauge has been patented by Mr. John S. Elliott, of Bombay, N. Y. It consists of a rod or bar formed in sections, connected to be folded up and adjusted upon one another, and also extended and clamped, to be inserted in milk cans and adjustably held therein, to indicate the height of the milk.

A fish trap has been patented by Mr. Elijah W. Jenkins, of Milford, Mo. The main frame has a false bottom, and there are supplemental frames with pivoted entrapping wires hung in alignment with the fish entrances, with means for raising and lowering the false bottom, and other novel features.

A paddle wheel has been patented by Mr. Washington Bryant, of Franklin, Ark. This invention provides a construction wherein the paddles enter and leave the water in an almost vertical position, but when in the water present the greatest bearing surface thereon, the invention covering novel details of construction and the combination of parts.

A seal lock has been patented by Messrs. Warren B. Waldron and George C. Boller, of Folsom City, Cal. It is more especially designed for use on freight cars when they are in transit, the parts being so arranged that the lock cannot be opened or tampered with without first breaking or injuring the seal, the lock being used as an ordinary padlock.

A combination padlock has been patented by Mr. Edwin L. Drake, of Winchester, Tenn. The invention covers a novel construction and combination of parts whereby a simply made lock can be used with a great number of combinations, and one tumbler will not be likely to be turned by the frictional contact of the next tumbler.

An electric surface railway has been patented by Mr. John A. Enos, of Boston, Mass. It is of that class in which storage batteries are used, and the invention relates more particularly to the connections for taking the current from the conductors along the line for charging the storage batteries, and also to the driving mechanism for propelling the car.

A chicken brooder has been patented by Mr. Charles Houser, of East St. Louis, Ill. It consists of a rectangular box or case provided with a water heating apparatus, and within which is arranged a coil of steam pipes and a brooding and a hiding board, all so arranged that the overcrowding of the chickens in any particular spot will be prevented.

A match safe has been patented by Mr. Alanson Cary, of New York City. It is a holder for match boxes having an automatic clamp or claw, with internal penetrating teeth to engage the match box and positively prevent its withdrawal, the box being broken out of the holder when the matches are used up.

A blind stop or slot fastener has been patented by Mr. George W. Williams, of Brooklyn, N.

Y. It consists of an apertured or notched segmental plate, adapted for attachment to either the slats or the frame of the blind, with a catch or locking device to engage with the plate, for holding the slats more or less open or wholly closed.

A conveyor has been patented by Messrs. Henry C. Krause and Benjamin Harris, of Lake Linden, Mich. It is a simple device for conveying grain, chips, minerals, etc., employing a reciprocating pipe or launder, having a feed pan secured to it, with a relatively stationary hopper leading into the reciprocating pan.

A supply tank for water closets has been patented by Mr. John Holden, of Taunton, Mass. The tank has an air reservoir with an apertured flexible bottom to which a tube is attached having an air inlet at the top, in connection with a lever and discharge valve, whereby the flow of water is prolonged or shortened according to the amount of air admitted.

An adjustable support for laundry tubs has been patented by Mr. Albert G. Robinson, of Brooklyn, N. Y. The invention consists of arms fastened to the frame and adjustably secured at their lower ends to the base supports of the tub, whereby the top frames can be easily adjusted to tubs of varying depth, and at the same time are held securely in place.

A pocket book clasp has been patented by Mr. Daniel M. Read, of New York City. A fastening plate is made to go on the body of the pocket book, formed with an open slot and provided with a retaining device for holding the locking stud in the recess, whereby the clasp may conveniently be opened with one hand by a downward and forward movement of the stud plate.

A cutting apparatus for mowers and reapers has been patented by Mr. John C. Voss, of Bedford, Ind. Combined with a finger bar having a way for the cutter bar is a grooved overlapping portion projected above the way, the cutter bar having a beveled rib on its upper side, with roller bearings between the rib and the overlapping portion of the finger bar, and other novel features.

A two wheeled vehicle has been patented by Mr. Frank W. Bowne, of Lincoln, Neb. The body has spring-suspended side bars carrying spherical-headed studs, sectional links being held upon the stud heads and other spherical-headed links connected to the side bars and engaged by the lower ends of the links, the mounting being designed to relieve the vehicle of "horse motion."

A machine for forming horseshoes has been patented by Mr. Charles L. Haight, of Poughkeepsie, N. Y. It has a plate supporting and carrying a forming die, in combination with stationary abutments and levers, with means for reciprocating the plate and die and the levers, the bar of iron from which the shoe is made being bent or folded around the reciprocating die.

A well drilling machine has been patented by Mr. William Manson, of Colton, Cal. It is designed to bore the well by a gravitating sand pump or tool, and has mechanism for raising and dropping a crown pulley with cable carrying a gravitating drilling tool, a spring in the bar on which the pulley is journaled lessening the jar and promoting the durability of the entire rig.

A combined reel handle and fishing reel has been patented by Mr. Abraham Coates, of Watertown, N. Y. The reel frame is adapted to screw into sockets upon the ends of the parts of the reel handle, the reel having a multiplying gearing to turn it, and a crank which may be transferred from the gearing to the reel itself, to secure both slow and fast winding, with other novel features.

A combination tool for loading cartridges forms the subject of two patents issued to Mr. Francis P. Devens, of Kansas City, Mo. It is adapted for loading the ordinary form of paper shell cartridge, and the device is designed to remove the exploded primers from the shell and apply new ones, and load and crimp the shell, in connection with an automatic shot and powder delivery apparatus.

An oil can has been patented by Mr. John H. Sutphen, of Huron, Dakota Ter. It has a false spring bottom and a valve in the spout with a spring-actuated rod attached thereto bearing upon the spring bottom, with other novel features, whereby the oil delivered from the can is under the complete control of the operator, and will be cleansed of grit and other impurities by a filter.

A clothes line holder has been patented by Mr. Andrew E. Norman, of Ishpeming, Mich. It consists of a board with a central face groove, having a dovetail metal strip along its center, with a cross bar and line-holding blocks, and other novel features, the line holders to be attached to opposite walls or supports to allow one or more lines to be stretched to form a clothes rack of any required capacity.

A buggy top has been patented by Mr. John D. Reed, of Julesburg, Col. The invention consists in a calash top vehicle having the combination of a transverse brace-connecting shaft journaled to the rear part of the seat and having braces fixed rigid at each end, with an actuating lever arm attached to have an oscillating movement in a vertical direction, with other novel features.

A system of irrigation has been patented by Mr. Augustin S. Haines, of Nashville, Iowa. It is designed more particularly for orchards or other tree-planted areas, and consists of a novel arrangement of pipes to be laid along the surface of the ground and connected to each other by couplings having water outlet passages, with other pipes driven or set into the ground receiving water from the distributing pipes.

A fountain brush for mucilage and other liquids has been patented by Mr. Allan C. Harrington, of Richmond, Va. It has a reservoir flattened at the bottom, so it will stand upright, and a tube on the opposite side holding a brush, there being a spring valve in the tube which opens when pressure is applied to the reservoir, the valve being adjustable to control the supply and for liquids of different density.

The producing of lithographic surfaces, or zincographic plates, forms the subject of a patent issued to Mr. Hermann Schoembe, of Offenbach-on-the-Main, Germany. It consists in subjecting the zinc plates to the action of a mixture of nitric and sulphuric acids, and then to the action of an ammonia salt, in a manner described, after which the plates may be used in the same way as the ordinary lithographic stones.

A power hammer has been patented by Mr. Henry St. Lawrence, of Northampton, Mass. The connection of the hammer stock is such that the hammer will deliver a swinging yielding blow, the shock of which is taken up by an independent base, the base of the main frame being relieved of all undue shock and jar, while a forward or backward adjustment of either the anvil or the hammer may be obtained.

A sharpener for reaper and mower blades has been patented by Mr. Louis P. Sefton, of Toronto, Ontario, Canada. Its body is approximately diamond shaped in cross section, and both body and handle are formed integrally from a composition chiefly of emery, by subjecting it to heavy pressure in a mould, a steel wire link being embedded longitudinally in the body and handle at the time of moulding to give greater strength.

A brake for windmills has been patented by Mr. John Thompson, of Holland, Mich. A wheel is carried upon the inner end of the shaft of the wind wheel, and a band is arranged in connection with it, in combination with a curved and outwardly projecting arm adjustably secured to the vane and adapted to engage the band, so that when the vane is thrown out of the wind, the brake will be automatically applied to the wheel.

A machine for automatically putting hinges upon boxes has been patented by Mr. Andrew C. Bolton, of Brooklyn, N. Y. Combined with two sets of nail holders, and hammers or drivers therefor, is a receptacle for hinges and a chute leading therefrom to a point adjacent to the hammers or drivers, a feeding finger forcing the hinges into position for action by the drivers, with other novel features, making a simple and durable machine.

SCIENTIFIC AMERICAN  
BUILDING EDITION.

APRIL NUMBER.—(No. 30.)

## TABLE OF CONTENTS.

1. Elegant plate, in colors, showing perspective elevation of a residence of moderate cost, with floor plans, sheet of details, etc.
2. Plate, in colors, of a cottage costing nineteen hundred dollars, with floor plans, sheet of details, etc.
3. Perspective view and floor plans of a house costing four thousand five hundred dollars.
4. Perspective elevation and floor plans of a dwelling costing two thousand two hundred dollars.
5. Floor plans and perspective view of a house costing three thousand two hundred dollars.
6. Plans and perspective elevation of a dwelling for two thousand eight hundred dollars.
7. A dwelling costing four thousand five hundred dollars. Perspective and floor plans.
8. Sketch of a dwelling in New Haven, Conn., with floor plans.
9. A city house of moderate cost.
10. Perspective view of a country house in Connecticut.
11. Floor plans and perspective view of a seaside residence erected at Long Branch, N. J. Cost, four thousand five hundred dollars.
12. Elevation and floor plans of economical workingmen's homes at Krupp's Steel Works, Essen, Rhenish Prussia.
13. Engraving and plan of a town hall or church.
14. View of Country residence of Mr. Kurtz—F. Gebhardt, architect, Ellwangen.
15. Page of engravings showing temporary trestle for supporting the cracked ceiling of the Assembly Chamber, Capitol Building, Albany, N. Y.
16. Vicarage House, Herrington, Durham.
17. Full page perspective view of the Caldwell Hotel, at Birmingham, Ala., Edouard Sidel, architect.
18. Page of drawings representing some of the exhibits of the late display of the Architectural League, of New York. A Spanish Grille. A French Farm House. A row of New Houses, New York. J. H. Duncan, architect.
19. Miscellaneous contents: Trees for Marsh and Mountains.—Rats and Matches.—Wood, Plaster, and Concrete.—Bulbous Plants for Apartments, three engravings.—Color in Greek Temples.—Fever from Sewer Gas.—New Use for Dynamite.—Wall Plates.—The Underpinning of the Great Yarmouth Town Hall.—A Relic of Old London.—Use of Sawdust and Shavings.—Dry and Damp Rot.—The Rose Acacia for Walls.—Moss for Plants.—Wood's Patent Extension Plumb and Level, illustrated.—The Painting of Iron Roofs.—The Reed Rocking Gate, illustrated.—The Dunning Hot Water Boiler, illustrated.

The Scientific American Architects and Builders Edition is issued monthly. \$2.50 a year. Single copies, 25 cents. Forty large quarto pages; equal to about two hundred ordinary book pages; forming, practically, a large and splendid MAGAZINE OF ARCHITECTURE, richly adorned with elegant plates in colors and with fine engravings, illustrating the most interesting examples of Modern Architectural Construction and allied subjects.

The Fullness, Richness, Cheapness, and Convenience of this work have won for it the LARGEST CIRCULATION of any Architectural publication in the world. Sold by all newsdealers.

MUNN & CO., PUBLISHERS,  
361 Broadway, New York.

## Special.

## A CRUEL OLD MONSTER.

A cruel old monster was "Giant Despair," as pictured by Bunyan in "Pilgrim's Progress." His plan was to drive people to desperation by making them low spirited and wretched. In other words, by giving them mental and spiritual dyspepsia. Having got them into this state of misery, he made an easy capture of them.

When an invalid is badly run down by dyspepsia or lung trouble, or by any chronic disorder, the danger is of becoming so weak as to despair of recovery. This is more especially the case where sufferers have tried one thing and another in hope of cure, but without success. A lady who for five years had been almost hopeless concluded as a last resort to try Compound Oxygen. Her trouble had been chronic irritation of the bowels. She had been almost entirely unable to walk. Eating had been torture. To these distresses had been added a severe attack of rheumatism. After using Compound Oxygen for three months she wrote to express her gratitude for being brought out of her misery. She says: "I frequently met with remarks of this kind, 'If you get well, no one need despair.' So you see it speaks for itself in my altered condition."

This good work should be known by everybody who wants to deal a blow at "Giant Despair." Write for pamphlet treatise to Drs. Starkey & Palen, 1529 Arch Street, Philadelphia, Pa. Sent free.

## 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 next issue.

Recipes and information on all industrial processes. Benjamin's Scientific Expert Office, 35 Wall Street, New York.

Duplex Steam Pumps. Volken & Felthousen Co., Buffalo, N. Y.

\$35,000 to \$40,000 will buy controlling interest in manufacturing business paying 25 per cent. Cause of selling, poor health. Address J. F. Hammond, Omaha, Neb.

Diamond Liquid. Warranted to drill any kind of steel and glass. Sample bottles, \$1. Diamond Liquid Co., No. 2 Carondelet St., New Orleans, La. Patent applied for. References.

Carter de Murguiondo, manufacturers' and patentees' agent, 223 Broadway, room 14, New York, wishes New York State agency for some good patented article or novelty, where profits are good.

In every community there are a number of men whose whole time is not occupied, such as teachers, ministers, farmers' sons, and others. To these classes especially we would say, if you wish to make several hundred dollars during the next few months write at once to B. F. Johnson & Co., of Richmond, Va., and they will show you how to do it.

Brass, iron, and steel work of all kinds. Send sample or description of what you want, and we will name price. T. F. Welch & Co., 8 and 10 Medford St., Boston, Mass.

Patent agents. T. H. McCulloch & Co., Omaha, Neb.

To Nut Manufacturers—For Sale: One Burdick hot pressed nut machine, of capacity 2 in. New, and offered at a remarkably low price. S. C. Forsaith Machine Co., Manchester, N. H.

For the latest improved diamond prospecting drills, address the M. C. Bullock Mfg. Co., 138 Jackson St., Chicago, Ill.

Patent foot power scroll and circular saw, mortisers, lathes. Seneca Falls Mfg. Co., 666 Water St., Seneca Falls, N. Y.

Burnham's turbine wheel is sold at net price to mill owners. Catalogue free. Address York, Pa.

The Diamond Prospecting Co., 23 W. Lake St., Chicago, Ill., general agents for the Sullivan diamond prospecting drills.

Forer Bain, 76 Market St., Chicago, designer and constructor. Electrical apparatus, fine and special machinery, etc.

Nickel Plating.—Manufacturers of pure nickel anodes, pure nickel salts, polishing compositions, etc. \$100 "Little Wonder." A perfect Electro Plating Machine. Agents of the new Dip Lacquer Kristaline. Complete outfit for plating, etc. Hanson, Van Winkle & Co., Newark, N. J., and 92 and 94 Liberty St., New York.

Perforated metals of all kinds for all purposes. The Robert Aitchison Perforated Metal Co., Chicago, Ill.

The Railroad Gazette, handsomely illustrated, published weekly, at 73 Broadway, New York. Specimen copies free. Send for catalogue of railroad books.

Supplement Catalogue.—Persons in pursuit of information of any special engineering, mechanical, or scientific subject, can have catalogue of contents of the SCIENTIFIC AMERICAN SUPPLEMENT sent to them free. The SUPPLEMENT contains lengthy articles embracing the whole range of engineering, mechanics, and physical science. Address Munn & Co., Publishers, New York.

The Knowles Steam Pump Works, 113 Federal St., Boston, and 93 Liberty St., New York, have just issued a new catalogue, in which are many new and improved forms of Pumping Machinery of the single and duplex, steam and power type. This catalogue will be mailed free of charge on application.

Link Belting and Wheels. Link Belt M. Co., Chicago.

Iron Planer, Lathe, Drill, and other machine tools of modern design. New Haven Mfg. Co., New Haven, Conn. Presses & Dies. Ferracute Mach. Co., Bridgeton, N. J.

The Holly Manufacturing Co., of Lockport, N. Y., will send their pamphlet, describing water works machinery, and containing reports of tests, on application.

Lathes for cutting irregular forms a specialty. See ad. p. 62.

For best forges, blowers, exhausters, hand and power drills address Buffalo Forge Co., Buffalo, N. Y.

The Improved Hydraulic Jacks, Punches, and Tube Expanders. R. Dudgeon, 24 Columbia St., New York.

Cut-off blade, 3/4 x 6 in., 30c. To forge, costs \$2.00. Dwight Slate Machine Co., Hartford, Conn.

Safety Elevators, steam and belt power; quick and smooth. D. Frisbie & Co., 112 Liberty St., New York.

Tight and Slack Barrel Machinery a specialty. John Greenwood & Co., Rochester, N. Y. See illus. adv., p. 28.

We are sole manufacturers of the Fibrous Asbestos Removable Pipe and Boiler Coverings. We make pure asbestos goods of all kinds. The Chalmers-Spence Co., 419 and 425 East 8th Street, New York.

#### Catarrah Cured.

A clergyman, after years of suffering from that loathsome disease, catarrah, and vainly trying every known remedy, at last found a prescription which completely cured and saved him from death. Any sufferer from this dreadful disease sending a self-addressed stamped envelope to Prof. J. A. Lawrence, 212 East 9th St., New York, will receive the recipe free of charge.

"The Improved Greene Engine." Safety stop on regulator. Providence, R. I., Steam Engine Co. are the sole builders.

For best quality, order your steel castings from the Buffalo Steel Foundry, Buffalo, N. Y.

Band saws, with tipping table. All kinds woodwork machinery. Rollstone Machine Co., Fitchburg, Mass.

Leather Link Belting is the most reliable for swift running machinery. For particulars write Chas. A. Schieren & Co., 47 Ferry Street, New York.

A Perfect Engine—Syracuse water motor, for driving light mach'y. Tuerk Water Meter Co., Syracuse, N. Y.

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



#### HINTS TO CORRESPONDENTS.

**Names and Address** must accompany all letters, or 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.

**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.

(1) J. D. asks how to make carbon paper or transfer paper. A. Mix lard to a paste with lampblack, rub this upon the paper, remove the excess with a rag, and dry the paper, which should be thin post or tissue paper.

(2) I. M. G. asks: 1. In Fig. 2, in your description of electric motor, in issue of March 17, is the iron wire which is wrapped on the spool insulated? A. It is partially insulated with shellac varnish. 2. Will it matter if more than one piece of wire is used, if they are twisted or joined together, and what is done with the ends of the wire? A. You may use several pieces, but the ends should be allowed to abut without being twisted. The outer end of the wire is held temporarily by shellac. 3. Will cotton cloth do to wrap the iron wiring? A. One thickness of thin cotton cloth applied with shellac varnish or thin glue will answer. 4. What will be the result if the coils of the armature do not have the same number of convolutions? A. The machine will have an irregular action. 5. Will any other screws work as well as brass wood screws? Will ordinary telegraph wire do instead of Stub's wire? A. Yes. 6. What is the rule of thumb? A. Virtually no rule at all. The meaning of the expression is that you should construct your machine by adapting one part to another as you proceed, without any special calculation. 7. In the field magnet, are the strips lapped over each other, or just brought up against each other? A. The ends of the strips should abut. 8. Will lead answer the same purpose as Babbitt or type metal? A. No. 9. What is to prevent the metal from filling up the entire opening and leaving no oil hole? A. Nothing; the oil hole is to be drilled. 10. How much space should be left between the field magnet and the armature? A. The smaller the space, between the armature and the field magnet, the better. 11. Can the motor be run either way by reversing the current? A. No; it can be done only by shifting the commutator brushes.

(3) G. G. asks if there is any particular way to lace a quarter turn belt so as to have an equal strain on both edges of the belt. A. Begin on the outside of the belt at the middle, pass one end of the lacing through one end of the belt and bring it out through the corresponding hole of the other end of the belt, laying it diagonally off to the left. Now pass the other end of the lacing through the hole last used, and carry it over the first strand of the lacing on the inside of the belt, passing it through the first hole used, and lay it diagonally off to the right. Now proceed to pass the lacing through the holes of the belt in a zigzag course, leaving all the strands inside the belt parallel with the belt, and all the strands outside the belt oblique. Pass the lace twice through the holes nearest the edge of the belt, then return the lace in the reverse order toward the center of the belt, so as to cross all the oblique strands, and make all the inside strands double. Finally pass the end of the lacing through the first hole used, then outward through an awl hole, then hammering it down to cause it to hold. The left side is to be laced in a similar way.

(4) J. M. C. writes: 1. I have just made six cells, 1 zinc 1½ inches by 3½ inches, 2 carbons 1½ inches by 3½ inches. I want to know if they will turn, or more than turn, the motor described in March 17 issue? A. Your batteries will turn the motor, but will give very little power. 2. Can I construct a smaller one on the same principle? A. Yes; follow out the same general proportions. 3. Can I make the field magnet solid, either wrought or cast, and, if built up, are the joints broken just where they happen to come?

A. Yes; when built up the joints are broken just as they happen to come. 4. How is induction coil made to suit as many of my cells as would be proper to use, in an ordinary medical battery? I would like to have working directions. A. For induction coils and very full directions for making, see SUPPLEMENT, Nos. 160, 166, and 569.

(5) E. H. L. writes: I am much interested in your admirable description of a small dynamo as furnished in SCIENTIFIC AMERICAN SUPPLEMENT, No. 600. I want such a one for running a single arc lamp, such as requires 50 Bunsen cells. This dynamo does not furnish E. M. F. high enough for such, I fear. Can it be wound with finer wire, and so made suitable for our needs without otherwise altering the dimensions? Perhaps you can also tell me where I could get such a one made complete, for a reasonable price, or of any other pattern that will answer. We want an experimental dynamo for general purposes as well as for the arc lamp of our projector. How high candle power does the dynamo furnish in an arc lamp? How will the light compare with an ordinary lime light? A. The dynamo, when made as described in the SUPPLEMENT, No. 600, will answer your purpose perfectly. To adapt it to an arc light, all you need to do is to connect all of the wires of the field magnet in series, then arrange the dynamo as a shunt machine, and add some resistance to that of the field magnet in the shunt, the amount to be determined by experiment. Then have the winding of the armature secured by a sufficient number of bands of brass wire to prevent its destruction by centrifugal action, also wrap the wires leading to the commutator cylinder with adhesive tape, and finally increase the electromotive force by increasing the speed to say 3,000 revolutions per minute. The light will be ample for projection. With a parabolic reflector it will be superior to the calcium light.

(6) G. R. F. asks the process of taking and using glue moulds. A. A good gelatine mould may be made in the following manner: Soak the best white glue in cold water for 24 hours, then drain off all the water. Melt the soaked glue in a water-jacketed kettle, then pour the glue upon the object, the latter being incased in a lead or pasteboard box. Let it cool for 12 hours, then separate the cast from the object. If the object be a statuette, a thread should be attached to the back, and extended out of the mould at both ends, so that it may be used for cutting open the mould after it is cooled, to permit of taking out the statuette. A good material for a mould is made in the following way: Dissolve 20 parts of fine gelatine in 100 parts of hot water, and a 1½ part of tannin and the same amount of rock candy. It is said that a mould made of gelatine or glue alone may be made more durable by pouring over it a solution of bichromate of potash in water, 1 part of bichromate to 10 of water, and afterward exposing it to sunlight. Most objects require oiling slightly before being covered with glue or gelatine.

#### TO INVENTORS.

An experience of forty years, and the preparation of more than one hundred thousand applications for patents at home and abroad, enable us to understand the laws and practice on both continents, and to possess unequalled facilities for procuring patents everywhere. A synopsis of the patent laws of the United States and all foreign countries may be had on application, and persons contemplating the securing of patents, either at home or abroad, are invited to write to this office for prices, which are low, in accordance with the times and our extensive facilities for conducting the business. Address MUNN & CO., office SCIENTIFIC AMERICAN, 361 Broadway, New York.

#### INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

March 20, 1888,

AND EACH BEARING THAT DATE.

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

Air heating device, M. T. Baldwin..... 379,755  
Alarm lock, G. Gibbs..... 379,642  
Animal releasing device, B. Borton..... 379,852  
Animal trap, J. T. Moxley..... 379,713  
Annunciator, electric, B. N. Botts..... 379,758  
Ant trap, M. Kell..... 379,581  
Atomizer, A. M. Shurtliff..... 379,611  
Axle box, car, D. H. Dugan..... 379,707  
Axle box, car, Lewis & Armstrong..... 379,651  
Axle box, car, D. Macnee..... 379,873  
Axle box lid, car, G. W. Morris..... 379,712  
Axle, car, J. H. Eaton..... 379,638  
Axle clip, L. S. White..... 379,839  
Bag holder, Roscoe & Grier..... 379,817  
Bale tie, L. C. Ryan..... 379,878  
Baling press, Houghton & Alexander..... 379,645  
Barrel head making machine, J. J. Philbrick..... 379,602  
Barrel roller, J. Boland..... 379,851  
Bathing the head, device for, A. Heinemann..... 379,646  
Battery. See Electric storage battery. Galvanic battery.  
Battery fluids, new mercuric salt for, A. Schan-schieff..... 379,820  
Belt fastener, W. O. Talcott..... 379,739  
Bicycle letter, T. Benfield..... 379,557  
Bills, letters, or samples, receptacle for contain-ing classified, A. Sanders..... 379,665  
Blackboard, spherical, W. R. Story..... 379,914  
Blackboards, attachment for spherical, W. R. Story..... 379,915  
Blind stop, G. W. Williams..... 379,748  
Boiler. See Steam boiler. Wash boiler.  
Boiler feeder regulator, G. A. Riedel..... 379,776  
Boiler flue cleaner, steam, C. G. Davison..... 379,564  
Boiler tube cleaner, G. M. Robinson..... 379,728  
Bolts, making hollow bars for stay, W. B. Weil..... 379,887  
Bookbinding, W. M. Kinnard..... 379,649  
Book folding machines, point mechanism for, J. H. Stonemetz..... 379,737  
Books, binding, Weston & Dykert..... 379,874  
Boot or shoe sole, F. A. Cushman..... 379,765  
Boot or shoe ventilator, A. Jensen..... 379,579

Boots or shoes, manufacturing, J. W. French..... 379,640  
Bottle, E. Storm..... 379,615  
Bottle stopper, G. L. Waitt..... 379,919  
Bottle stopper and fastening, S. L. Wiegand..... 379,623  
Box. See Axle box. Feed box. Packing box.  
Brake. See Car brake.  
Bread, preparation of, J. Robertson..... 379,727  
Buckle, harness, J. M. Smith..... 379,613  
Burner. See Gas burner. Lamp burner.  
Button, A. J. Shipley et al..... 379,912  
Button, F. H. Thier..... 379,742  
Button, detaching device, B. Poulson..... 379,804  
Button, detaching device, W. D. Schiefer..... 379,809  
Can. See Jacketed can. Oil can.  
Candy, machine for making, H. W. Hoops..... 379,871  
Car brake, automatic, De Coar & Keast..... 379,687  
Car coupling, Crow & McMackin..... 379,563  
Car coupling, R. H. Dowling..... 379,888  
Car coupling, T. E. Halls..... 379,781  
Car coupling, J. A. Hinson..... 379,785  
Car coupling, C. E. Michaud..... 379,803  
Car lighting, application of electricity to, C. A. Faure..... 379,567  
Car link, self-coupling, Wardwell & Landon..... 379,621  
Cars, draw gear for street, B. McDewitt..... 379,587  
Cars, heater for railway, R. M. Dixon..... 379,691  
Carriages, sunshade for baby, H. S. Smith..... 379,734  
Carrier. See Cash carrier.  
Cartridge crimper, J. W. Brittin..... 379,853  
Cartridge loader, F. P. Devens..... 379,636  
Cartridges, combination tool for loading, F. P. Devens..... 379,635  
Cash carrier, D. Lippy..... 379,583  
Cash carrier apparatus, pneumatic, J. L. Given..... 379,890  
Cash carriers, locking and releasing mechanism for, H. Thomas..... 379,618  
Cement, self-hardening, F. Jurschina..... 379,580  
Centrifugal separators, motor for operating, G. De Laval..... 379,690  
Chair. See Collapsible chair.  
Chart, time, D. F. Crane..... 379,862  
Chopping knife, M. Ludwig..... 379,584  
Churn, E. F. Beard..... 379,848  
Cigar bunching machine, A. C. Schutz..... 379,732  
Clasp. See Pocketbook clasp.  
Cleaner. See Boiler flue cleaner. Boiler tube cleaner. Street cleaner.  
Clip. See Axle clip. Whiffletree clip.  
Clod crusher and ground leveler, Delano & Cum-mins..... 379,565  
Clothes line holder, A. E. Norman..... 379,717  
Coffee roasting apparatus, I. C. Gordon..... 379,891  
Coffin, H. Rice..... 379,814  
Coffin fastener, W. J. Noble..... 379,715  
Collapsible chair, H. S. Whitehead..... 379,670  
Color or ink pad, J. B. Loughton..... 379,798  
Comb. See Curling comb.  
Comb cleaning apparatus, G. H. McKee..... 379,588  
Connecting rod, L. H. Nash..... 379,806  
Converter, R. W. Hunt..... 379,894  
Conveyer, Krause & Harris..... 379,704  
Cores, making dry sand, J. H. Blessing..... 379,672  
Corn husker, L. H. Sholder..... 379,825  
Corn shellers, cylinder for, H. Poucher..... 379,603  
Cotton gin, G. F. Brott..... 379,760  
Cotton press attachment, W. F. Southard..... 379,828  
Cotton stalk cutter, M. D. Oneal..... 379,566  
Coupling. See Car coupling. Hose coupling.  
Pipe coupling. Thill coupling.  
Crusher. See Clod crusher.  
Curling comb, C. S. Levy..... 379,650  
Curtain, drop, J. P. Smith..... 379,614  
Cutter. See Cotton stalk cutter.  
Cutting apparatus, J. C. Voss..... 379,881  
Digger. See Potato digger.  
Ditching and grading machine, D. D. Kuhlman..... 379,705  
Dock, J. M. Cornell..... 379,861  
Draught attachment for plows, H. E. Bradbury..... 379,676  
Drawers, L. L. Bertonneau..... 379,558  
Drill. See Potato drill.  
Edger, W. F. Parish..... 379,659  
Edger, gang, W. F. Parish..... 379,658  
Electric heater, C. Seiler..... 379,822  
Electric machine, dynamo, M. Deprez..... 379,889  
Electric machine regulator, dynamo, T. A. Ed-ison..... 379,771  
Electric storage battery, C. D. P. Gibson..... 379,572  
Electrical connections, plug for making, G. Otto..... 379,598  
Electrical distribution, system of, T. A. Edison..... 379,772  
Elevator. See Rack elevator.  
Elevator, N. C. Bassett..... 379,556  
Engine. See Gas engine. Steam engine.  
Excelsior, machine for making, W. H. Moore..... 379,532  
Fare boxes, locking receptacle for, G. Reimann..... 379,811  
Faucet, filtering, W. H. McDonald..... 379,801  
Feed box and end gate, combined, H. Gamble..... 379,569  
Feed water purifier, Allen & Bowers..... 379,671  
Fence, I. L. Landis..... 379,706  
Fence making machine, S. L. Kline..... 379,791  
Fencing, barb for wire, W. H. Rodden..... 379,729  
File holder, paper, L. Banks..... 379,846  
File, paper, T. W. G. Cook..... 379,880  
File receptacle, A. L. Brown..... 379,678  
Filing receptacle, A. L. Brown..... 379,560  
Firearm, magazine, H. Leineweber..... 379,794  
Fire bowls, upper and lower plate for, A. S. Newby..... 379,594  
Fire extinguisher, J. O. Banning..... 379,756  
Fire extinguisher, hand, J. E. Long..... 379,708  
Fire kindler, E. E. Brewster..... 379,631  
Fish trap, E. W. Jenkins..... 379,701  
Flower stand, Duffie & Weston..... 379,637  
Frame. See Quilting frame. Window frame.  
Fuel cartridge, Herron & Hugentobler..... 379,687  
Furnace. See Slag furnace.  
Furnace protecting, F. W. Gordon..... 379,634  
Fuse, shell, T. Nordenfiet..... 379,716  
Gauge. See Milk gauge.  
Galvanic battery, A. Schanschiff..... 379,911  
Gas and air commingler, B. S. Dunn..... 379,769  
Gas burner, G. K. Cooke..... 379,562  
Gas engine, J. Noble..... 379,807  
Gaseous explosions as a motive force, utilizing, T. H. Bolmer..... 379,674  
Gate. See Sliding or rolling gate.  
Gate, G. P. Price..... 379,660  
Glove, F. H. Busby..... 379,855  
Gong, door, D. S. Adams..... 379,626  
Governor, engine, G. M. Hopkins..... 379,872  
Grain binder knotting device, Whiteley & Dyer..... 379,622  
Grain meter, J. O. Marks..... 379,740  
Grate, H. P. Tallmadge..... 379,740  
Grate and feedwater heater, hollow, W. J. King..... 379,790  
Grinding mill, G. H. McCulloch..... 379,900  
Gun, cane, E. D. Bean (r)..... 10,910  
Gun cartridges, recoil cushion for, E. Hill..... 379,763  
Gun, spring, T. Harding..... 379,782  
Hammer, foot power, C. J. Rundquist..... 379,818  
Handle. See Reel handle. Tool handle.  
Harrow, reversible folding, J. M. Shubert..... 379,826  
Harvester, low down grain binding, D. Strunk..... 379,830  
Harvesters, knotting mechanism for, R. Brown..... 379,886  
Hasp lock, Kime & Williams..... 379,686

Hat wires, machine for applying clasps to, J. Nutt..... 379,876  
Hatchet and plane, combined, J. Brandt..... 379,877  
Hay binder, C. W. Baker..... 379,556  
Hay rake, horse, J. H. Jones..... 379,895  
Heat and power supply system, T. R. Timby..... 379,744  
Heater. See Electric heater.  
Heel nailing machine, F. F. Raymond, 2d..... 379,810  
Heel plate guide, R. H. Lewis..... 379,888  
Height and the weight of persons, machine for determining or indicating the, C. C. Clawson..... 379,859  
Hinge, friction, F. W. Mix..... 379,901  
Hinge, lock, J. Wolf..... 379,921  
Holder. See Bag holder. Clothes line holder. File holder. Pen holder. Sash holder. Water-melon holder.  
Hook. See Lever hook. Wardrobe hook.  
Horses, interfering device for, M. Haughey..... 379,644  
Horsehoe blank, P. F. Greenwood..... 379,779  
Horsehoes, machine for forming, C. L. Haight..... 379,686  
Hose coupling, C. W. Boluss..... 379,845  
Iron or other fluid stand, A. P. Pichereau..... 379,906  
Iron. See Sad iron.  
Jacketed can, O. G. Bick..... 379,757  
Knife. See Chopping knife.  
Knitting machine, circular, L. E. Salisbury..... 379,819  
Knitting machines, electrical stop motion for, W. Talcott, 2d..... 379,832  
Knives and forks, die for straightening, E. G. Ost..... 379,697  
Knob attachment, W. H. Flinn..... 379,639  
Ladder, fire, A. J. Sutherland..... 379,616  
Lamp, B. B. Schneider..... 379,610  
Lamp, C. S. Upton..... 379,836  
Lamp burner, F. Rhind..... 379,813  
Lamp, electric arc, E. R. Knowles..... 379,792  
Lamp, hanging, F. Rhind..... 379,806  
Lamp, incandescent electric, T. A. Edison..... 379,770  
Lamps, socket and key for incandescent, G. Wilkes..... 379,842  
Lantern, C. W. Colony (r)..... 10,911  
Lantern, tubular, R. Hermance..... 379,868  
Last, shoemaker's, L. E. Miles..... 379,590  
Latch and lock, combined, M. Jobborn..... 379,788  
Lathe, R. C. Fay..... 379,568  
Leather cutting machine, J. Cave et al..... 379,857  
Leather splitting machine, A. Hull..... 379,700  
Levee and ditching machine, E. J. Engman..... 379,864  
Level, plumb, C. Ritz..... 379,682  
Lever hook, cable, M. E. Pugh..... 379,721  
Lithograph surfaces, producing, H. Schoembs..... 379,731  
Lock. See Alarm lock. Hasp lock. Nut lock. Railway switch lock.  
Logs, machine for shaving off the bark from, N. H. Brokaw..... 379,559  
Loom temple, W. H. Taylor..... 379,917  
Manufacture, W. C. McFeyre..... 379,654  
Mask, baseball, D. J. O'Sullivan..... 379,655  
Match safe, A. Cary..... 379,680  
Mattress, air, G. H. & B. F. Snavely..... 379,827  
Measuring reel, E. M. Thomas..... 379,743  
Mechanical movement, Elliott & Reid..... 379,775  
Mechanical movement, electro, J. F. McLaughlin..... 379,802  
Metals, treatment of, G. W. Gesner..... 379,866  
Meter. See Grain meter. Water meter.  
Milk gauge, J. S. Elliott..... 379,682  
Mill. See Grinding mill. Sawmill.  
Monocycle, H. Behr..... 379,849  
Mortising machine, endless chain, C. H. Douglas..... 379,566  
Motor. See Water motor.  
Muffler, steam, G. F. Royer..... 379,808  
Musical instruments, repeating check for music sheets of mechanical, J. Crannell..... 379,887  
Nail machines, die holder and straightening de-vice for wire, M. M. Smith..... 379,735  
Nut lock, J. B. Crossley..... 379,686  
Oil can, J. H. Sutphen..... 379,738  
Oil feeder, N. Seibert..... 379,783  
Oiler, automatic, Griswold & Bradbury..... 379,643  
Ores, reduction of, H. Hirsching (r)..... 10,912  
Packing box, A. T. Linderman..... 379,652  
Pad. See Color or ink pad.  
Pail cover fastening, C. F. Loomis..... 379,797  
Paper cutters, means for operating, W. F. Hill..... 379,784  
Paper folding machine, W. Hill..... 379,688  
Paper for carpet linings, etc., folded, A. Gibb..... 379,571  
Pencils, rubber tip attachment for, L. S. Bacon..... 379,844  
Pen holder, J. A. Kimball..... 379,789  
Pipe. See Sheet metal pipe. Tobacco pipe.  
Pipe coupling, D. W. Magee..... 379,798  
Pipe coupling, flexible, P. M. Askren..... 379,625  
Pipes, die for threading and cutting, G. Williams..... 379,624  
Piston, A. M. Morrill..... 379,711  
Pitcher, water, T. Shaw..... 379,523  
Planer, road, J. C. Steele..... 379,829  
Platter, D. B. N. Turner..... 379,834  
Planter, automatic check row corn, E. C. Culver..... 379,634  
Planter, check row corn, J. E. Bering..... 379,850  
Planter, corn, C. E. White..... 379,838  
Planters, attachment for corn, M. Schmucker..... 379,821  
Planting attachment, corn, F. L. Aten..... 379,554  
Plow, J. McArthur..... 379,653  
Plow, E. Hixon..... 379,647  
Plow and planter, combined, W. F. Leslee..... 379,897  
Plow or cultivator, listing, J. S. Crum..... 379,896  
Plow, sulky, M. T. Hancock..... 379,882  
Pocketbook clasp, D. M. Read..... 379,724  
Potato digger, P. A. Chippendale..... 379,682  
Potato drill, J. L. Uish..... 379,745  
Press. See Baling press.  
Pressure, apparatus for regulating fluid, J. B. Stobaueus..... 379,667  
Pressure regulator, automatic fluid, W. D. Shel-don..... 379,824  
Pressure regulator, fluid, W. B. Mason..... 379,586  
Printers' rules, machine for cutting, W. H. Gold-ing..... 379,777  
Printers' rules, machine for mitering, W. H. Golding..... 379,778  
Printing device, Adams & Seymour, Jr..... 379,884  
Quilting frame, B. W. Raines..... 379,861  
Rack elevator, W. R. Fitchit..... 379,688  
Railway and car, elevated, J. L. Chapman..... 379,881  
Railway and conduit for electric wires, etc., ele-vated, A. C. Oehrlie..... 379,904  
Railway, cable, E. V. Johnson..... 379,648  
Railway grading and excavating machine, M. E. Puch..... 379,722  
Railway switch lock, W. T. Manning..... 379,709  
Railway tie, C. P. Hawley..... 379,574  
Railway tie and chair, metallic, C. C. Singer..... 379,612  
Railway tie, combined wood and metal, C. P. Hawley..... 379,575  
Railway tie, metallic, C. P. Hawley..... 379,576  
Railway track, cable traction, W. H. Young..... 379,922  
Railways, traction increasing system for electric, E. E. Ries..... 379,909  
Rake. See Hay rake.  
Rasp, R. Volschitz..... 379,620  
Reel. See Measuring reel.  
Reel handle and fishing reel, combined, A. Coates..... 379,683  
Regulator. See Boiler feeder regulator. Pressure regulator.