

Weeds Most Troublesome to Farmers.*

Wild lettuce, Russian thistle, Canadian thistle, Spanish needle, oxeye daisy (a species of chrysanthemum), wild and black mustard, purslane, stick weed or beggar's lice, burdock, yellow dock, bracted plantain, horse nettle, buffalo bur, wild carrot, rag weed and dog fennel.

Some of these weeds are annuals, some are biennials and some are perennials, and a knowledge of these distinctions enables the farmer to intelligently deal with the pests. Take, for example, the common burdock; it is a biennial—that is, it grows from the seed, and the first year it grows large leaves but does not throw out any seed stalk; the second year it goes to seed, and its burs containing the numerous seed pods will stick to live stock. Did any of you ever see sticking to stock these burs to be thrashed out in the pastures and over the farm, thus scattering the seed? Now, during the first year's growth of a burdock there is no use to cut it—in fact, it does more harm than good; but the second year, when it sends forth its seed stalk, just before it blossoms, cut it down in the vigor of its evil existence, and it will be dead forever. On the other hand, the yellow dock is a perennial, like timothy, and is a very mean weed. Its seeds do not spread so easily, but cutting it off does not kill it. It should be dug up, root and branch, and cast into the fire, that its seed may perish from off the earth.

Some weeds, especially annuals or biennials, may be killed by mowing them just before, or at the time, they blossom; but there are other weeds which cannot be killed by mowing after they are in bloom—for example, the Canada thistle will mature its seed even though it is cut down immediately after it has blossomed, as there is enough substance in the stalk to mature the seed.

The wild lettuce you all know very well, though the acquaintance is somewhat brief and disagreeable. It is a biennial, sometimes annual. It came to this country from Europe; its seeds are lighter and carried more easily than the thistle; it is a hardy plant and should be pulled out by the roots. The stem, close to the ground, is prickly and cannot be pulled without a covering on the hand. It is most troublesome in meadows; sheep will eat it and keep it in check in pastures. A full grown plant will produce about ten thousand seeds. There is a fungus which comes with

this weed which will attack cultivated lettuce. When cut near the ground it will send up additional sprouts which will go to seed.

The Russian thistle first appeared in Dakota in 1873, and is now found over the greater part of the State. In some places the fields have been abandoned. It was first noticed in Ohio in 1894 along the tracks of the Lake Shore Railroad, near Bryan. It is one of the worst weeds known, and a large portion of Europe is afflicted with it. It is an annual and should be cut down when it first blooms, for one plant will produce about twenty thousand seeds.

The Canada thistle grows about two feet high; has prickly leaves, rose purple flower, and is the lightest colored of all thistles. It has the power of reproducing itself from roots as well as seeds. It is a perennial plant, and therefore more troublesome than either the wild lettuce or the Russian thistle. It is often shipped from place to place in baled hay. It originally grew in Europe and not in Canada, but it reached this country from Europe through Canada. It is more common in Canada than in the United States. While it is more difficult to suppress than the Russian thistle, the Russian thistle is much more injurious. The better way is to never permit this pest to mature on the farm. After it or any other weed once obtains a foothold, the labor multiplies many times to suppress it.

Wild and black mustard are annuals—that is, they produce seed each year. The plants themselves die, and the following year the seed will grow and mature seed. After the ground has become full of this seed, the successful way to treat them is to mow each year, just as they bloom. If this be done for two or three years, the plants can be destroyed. But if the plants be growing in a meadow, they will mature seed before the grass is ready to cut, so that such fields should be pastured or cultivated.

Purslane you are all acquainted with, from its fleshy leaves and stems. It is a creeping plant, but can mature more seed to each plant than any other known plant. It is estimated that one plant will bring forth a million seeds, and it may be very troublesome when the ground becomes thoroughly seeded to it. The way to kill it is to cut off when it has reached a mature size, and before it has produced seed, and turn it to the sun. It is an annual, growing each year from the seed.

Stick weed or beggar's lice are troublesome little seeds that will stick to animals and especially to the

wool of sheep, but are easily suppressed if mown during their growth. Bracted plantain is a plant that grows annually from the seed, and may therefore be suppressed. The buffalo bur you are no doubt all familiar with, and it is easily suppressed, provided the plant be cut off before it goes to seed. It is an annual, and will not reproduce itself from the roots. Wild carrot is a very bad weed, and if there be but little of it, it should be dug up by the roots, and always, of course, mowed just at or before the time it blooms. It is a biennial. Rag weed is the most common weed in this country, and the best time to suppress it is when there is plenty of moisture to germinate all the seed; then mow off the weeds before the seed can mature; rake them up and let them rot, as they contain a good deal of fertilizing material.

The Spanish needle is an annual and may be suppressed by mowing before the seed can mature. It is a very troublesome plant and should be suppressed.

Much injury was done to the wheat last year because of the rag weed, there being so much rain that when the wheat was thrashed, the rag weed being wet caused some of the wheat to spoil, whereas, had there been no rag weed with the wheat, it would have dried out, so as to have done no injury. Thus thousands of dollars were lost to the farmers of Allen County alone because of the rag weed. It is an annual. The roots never reproduce; therefore mowing the ground, or cultivating it for two or three years, will destroy most of the seed. If the ground is thickly sodded, it will choke out the rag weed, but the seed will retain vitality for some length of time, so that when the meadow is broken up the rag weed will again appear. There are many other weeds that might be mentioned, but the same rule applies to the manner of suppressing them.

One of the greatest items of cost in the production of a crop is for labor expended in the extermination of weeds in order to give the crops a chance. If there were no weeds produced from the soil, the later cultivation of the crop would not be necessary. The value of the field crops in the United States for the year 1894, including wheat, corn, oats, rye, barley, buckwheat, tobacco, potatoes and hay, was one billion, six hundred and thirty million, eight hundred and seventy-three thousand, seven hundred and ninety-five dollars. Direct loss to machinery and stock and decrease in value of crops by reason of weeds amounted to ten million dollars.

*By Hon. J. D. Cable, in Annual Report of Ohio Farmers' Institutes.

RECENTLY PATENTED INVENTIONS.**Railway Appliances.**

CAR FENDER.—James K. Young, Meriden, Conn. This fender is a pivotally mounted frame having forward wheels which travel on the car track when the fender is down in operative position, and a portion of the fender is arranged to move forward when a person is caught upon it, thus holding one on the fender instead of throwing him in a way which might be dangerous to life or limb. The fender is readily attached to or removed from a car, and may be conveniently folded up against the dashboard if desired.

TRACK BRAKE.—Jefferson U. Elwood, McKeesport, Pa. This invention covers an improvement on two formerly patented inventions of the same inventor, and provides a shoe for track brakes of greater holding power than the ordinary shoe, and a more efficient mechanism for applying power to the shoe. The shoe has dovetailed or inwardly expanding recesses in its under surface, the recesses being filled with moulded blocks arranged to have a higher frictional resistance than the body of the shoe, and the operating mechanism comprises a worm and worm gear to which a grooved cam of decreasing radius is attached, giving great power in the application of the brake, by a movement which is rapid in the beginning, but slower and with increased power at a later portion of the application.

Electrical.

POWER TRANSMISSION.—Emil Lanhoff, Mulhausen, Germany. This invention relates to systems in which the motors may be capable, within wide limits, of gradually altering their rotary speed, instead of a step-by-step variation, the electrical connections being also so arranged that the size of the motors will be reduced to a minimum for high running efficiency. A regulating device is provided for the armature comprising a plurality of circuits whose potentials are to each other approximately as the terms of a geometric progression, in combination with another operatively connected regulating device comprising a plurality of resistances arranged in series to control the intensity of the field, whereby the variation of intensity will be approximately the same for all differences of potentials.

Bicycles, Etc.

A MUSICAL ALARM SIGNAL.—Rudolf Hartmann, Alfred Hartmann and George F. Reinhard, Jersey City, N. J. From a hanger loosely mounted on the head, according to this invention, two trumpets are pivotally supported over the front wheel, there being in each trumpet one or more reeds, each supported on a diaphragm, and a piston being arranged to have movement in each trumpet by means of cranks on a small grooved wheel which is brought into contact with the front wheel of the bicycle when the rider presses down on a handle or push bar attached to the handle bar. Any instrument of a musical type to be operated by the compression or exhaustion of air may be used instead of the trumpets, making the tones of an organ pipe or reed, or a whistle, or their equivalents.

Agricultural.

REAPING MACHINE.—Mihail Alexandrescu, Bucharest, Roumania. A machine to be propelled by hand, instead of being drawn by draught animals, is provided by this invention, and consists of a frame mounted on two wheels, with a cutter on its forward end to be operated by a connection with the axle, while an endless apron carries the stalks which are cut to a rack, where they accumulate in quantities corresponding to sheaves, when they are pushed off to be bound by hand. The knife bar carries three-sided blades, and has a reciprocating motion, being brought down to the proper distance from the ground by raising the rear end of the frame by the handles on which the operator pushes.

Mechanical.

BELT APPLYING DEVICE.—Fordyce A. Savage and Milan G. Wade, Dowagiac, Mich. To facilitate putting belts on pulleys, drums, etc., these inventors provide a simple form of adjustable clamping device to engage the periphery of the pulley and project to one side, where it engages one side of the belt, lifting the belt and turning it upon the pulley, after which the device drops from the pulley, as the latter makes a half revolution, bringing the device from beneath the belt. The device is made in two sections adapted to slide upon each other, so that it may be used on all sizes of pulleys.

PLUMB AND LEVEL, ETC.—Edward D. Beatty, Louisville, Ky. This invention affords a combination of a plumb and level with an ordinary folding rule, which may be conveniently carried in the pocket. A level glass with a suitable amount of liquid is held in a casing which is connected with the rule by a link, so that it may be made to rest on the side of the rule when the latter is in horizontal position for use as a level, or on the end of the rule when the latter is to be employed as a plumb, the casing being of a length equaling only the width of two members of the rule.

Miscellaneous.

COMPUTING SCALE BEAM.—William R. Dunn, Alton, Ind. A hollow weighing beam, according to this invention, has graduations to indicate units of weights, and located within this beam is a price indicating beam having suitable graduations, two weights being movable along the hollow weighing beam and adapted for joint or independent use to indicate the weight and the price at the same time. The improvement is designed especially to simplify the construction as well as to render less expensive scales of this description, adapting them also for convenient use for a wider variety of articles.

THEATER CHAIR MIRROR.—Samuel Walker, Brooklyn, N. Y. An attachment for mirrors is provided by this invention for use with any upright or nearly upright support, the mirror with its fixed housing or casing being adjustable and movable and being normally concealed and protected. A shifting device is arranged to be operated by the

foot in such manner as to slide the mirror out from its casing and hold it in exposed position as desired, leaving the hands entirely free, so that one facing the mirror may have a perfect view of the head and upper portion of the body without elevating the mirror above the top of the chair to which it is applied.

STOVE GRATE.—Edmund E. Flint, Tonawanda, N. Y. This is a grate for coal stoves which virtually constitutes an extension of the fire pot, and is so made that when shaken it grinds the cinders that may be between the sections, throwing out slate from its marginal portions, thus preventing the portion of the grate through which ashes pass from becoming clogged, and also promoting the draught. The grate is made with a pan section and a rim section, both provided with teeth, and each having movement in the same horizontal plane, one below the other, but the two sections moving in opposite directions, and one section moving faster than the other.

BANDAGE CUTTING MACHINE.—John R. Volz, New York City. A machine adapted to cut several strips of varying widths at one time, and capable of different adjustments to regulate the tension of the material while being cut, forms the subject of this patent. The machine comprises a suitable frame in which are journaled various shafts to rotate in unison, the driving shaft being turned by a handle on a pulley, from which is driven a cutter shaft and two winding shafts, the latter shafts being slidably mounted. The machine is of simple construction and easy to operate.

GARMENT CLASP.—Joseph Stern, New Orleans, La. This is a device more especially designed for use on the opening flaps of trousers, and permits of conveniently fastening the staple in place without stitching. A hook and a staple, each made of a single piece of sheet metal, are secured to the two flaps, the metal of the staple being bent upon itself to form two members, one having at its free end a pointed tongue to engage an opening in the end of the other member after it has been passed through the cloth.

A FISH NET NEEDLE AND WINDER.—George W. Raymond, Warrenton, Oregon. In needles for knitting fish nets and machines for winding twine on the needles, this inventor provides a needle having jaws or points at one end and means for regulating the space between the points of the jaws, while the winder comprises a rotary shaft to rotate the needle on a post which may be clamped to a table, and a spreader plate to open the points of the needle, the spreader plate having an eye for the passage of the twine.

VEHICLE ROLLER BEARING.—John R. Richardson, Madera, Cal. For the hub bearings of vehicles designed to carry heavy loads, this invention provides a bearing which extends the length of the spindle portion in order that the weight may be borne uniformly through the whole of such portion, to prevent the breaking down or crushing of the rollers or the boxing or spindle. It consists of rollers which bear for their full length between the box and spindle, there being a collar at each end of the box, and fitted to the collars are separate plates having projections which extend between the rollers at the ends.

PRISON CELL, VAULT, ETC.—Frank Peterhanel, Brooklyn, N. Y., and George H. Rothmann, Rutherford, N. J. The door, window grating or wall of a cell or vault, according to this invention, is composed of a network of connected pipes adapted to be connected to an exhaust device, this system being connected with a pipe leading to a central office, where an alarm valve is held on the pipe and closed by atmospheric pressure or adapted to be opened by a spring, sounding an alarm. A connected indicating disk also makes a corresponding alarm, giving the number of the cell, when a break has been made, destroying the vacuum in any of the pipes, the improvement being applicable to treasure vaults as well as prison cells, etc.

POST HOLE DIGGER.—Hugh L. T. Overbey, Summerville, Ga. This device has a lower cutting cylinder with internally beveled bottom cutting edge, and longitudinal slots in its side walls, and at the upper end of the cylinder is a hollow shank in which is secured the handle. A spring-pressed push plate is held movably in the cylinder, there being a foot piece for moving the push plate outward to remove the dirt taken up by the cylinder, the push plate returning to its normal position on removing the foot pressure, and not interfering in the least with driving the cylinder down into the ground.

FRUIT CLEANER.—Alexander Chambers, Newtown, Pa. For cleaning currants, raisins, dried apples, prunes, etc., this machine consists of a frame in which rails are arranged on an incline to support a slidable screen, conveniently adjustable in relation to a brush, the parts being so arranged that the brush and screen may be readily removed, and means being provided for the proper breaking up of the lumps before the fruit is acted on by the brushes. Screens of different mesh are provided for various kinds and sizes of fruit.

BAG TIE.—Albert Davison, Belvidere, Ill. A simple, easily operated fastener, which can be cheaply made and applied without injury to the bag, is provided by this invention. It comprises a plate section and a stud section, the latter having a hooklike main tongue and opposite guide and retaining tongues, the latter being deflected to form a hump. Means are provided for detachably connecting the plate section and the stud section, a cord or line of twisted wire being used in connection with the device.

BAG FASTENER.—Newell F. Wightman, Meriden, Conn. This invention relates to metallic fasteners for grain bags, and comprises a fastener made of two pivoted sections, an inwardly extending tooth on each section, a ratchet toothed arm on one section and on the other section a boxing having an opening for the passage of the arm. A block is adapted to engage the arm, a stem extending from the block through the end wall of the boxing, a spring surrounding the stem, on the outer end of which is a finger piece. The fastening maintains a substantially circular form and position, and will not slip from the bag.

HUB ATTACHING DEVICE.—Simon J. Harry, Washington, D. C. The axle, according to this improvement, comprises a spindle with a threaded stem and a non-circular seat at its inner end, on which is fitted

a collar having in its outer side a recess to receive a spring pawl, while the nut has a flange on whose inner side is a notch forming a seat for the pawl, there being an opening through the flange for the insertion of an instrument to release the pawl.

PUMP.—James A. Fink, Russell Springs, Kansas. This pump presents a novel construction of reciprocating water tubes and cylinders, and intermediate connections between them designed to counteract or compensate for the momentum of the pipes and the water they contain when the pump is being operated, as well as their inertia at the start of each stroke.

AIR SHIP.—Thomas M. Crepar, Grand Rapids, Minn. This flying machine has elongated upper and lower balloon sections, connected by a hanger band and cordage, there being on each side of the lower shell aeroplanes, while projecting upwardly from its bottom in the interior is a cabin, below which is a power room and propelling and controlling devices.

RAZOR GUARD.—Howell T. Fisher, Pottsville, Pa. This is an extremely simple and inexpensive device adapted for convenient attachment to and adjustment on either side of a razor blade, to render self-shaving easy and safe.

HOLDER FOR CALENDARS, ETC.—Hugh Brown, Ann Arbor, Mich. This invention provides a holder consisting of a casing with opening in its back, and provided with a keeper, a spring-retaining device, a tongue adjustably connected with the back of the casing, and other novel features, the device being well adapted to hold the sheets of a calendar or teachers' class records, lists of words or other matters to be kept in a certain order and in convenient shape.

SHOE STOOL.—Charles J. Sawyer and Thomas F. Harris, Anniston, Ala. This stool comprises a stand at one end of which is a seat for a salesman or fitter, while at its other end is a fixed heel rest and a spring plate for the shoe sole to rest on, there being means for guiding the free end of the spring plate. The improvement is designed to facilitate the proper fitting of a shoe on the foot of a customer in shoe stores.

MANHOLE AND COVER.—John T. Cullen, Clinton, Iowa. To increase the strength of a boiler head and prevent leakage by forming a steamtight joint, according to this invention, the manhole is made with an annular marginal recess on its inner face, in which fits an annular marginal ridge of the cover, which is secured in place by outwardly extending bolts, threaded at their outer ends and held by nuts in screw-threaded apertures of yokes whose ends rest on the marginal bead of the manhole.

BURIAL CASKET.—Charles A. Ruebekam, Owosso, Mich. The covers or lids of the casket, around that portion at which the face of the occupant is to be exposed, according to this invention, are so constructed that their position may be readily changed to expose more or less of the person, the keepers for the covers, also, being hardly discernible in the moulding, and provision being made for the entire removal of the covers when required.

Designs.

HAT SUPPORT.—Harriette G. Cozzino, New York City. This invention is for a hat and garment support more especially designed for theater chairs, and consists of a body adapted for application to the back of a chair, and a front member with which a mirror is pivotally connected, the device not only serving as a rack, but facilitating the rearrangement of one's toilet.

NOTE.—Copies of any of the above patents will be furnished by Munn & Co. for 10 cents each. Please send name of the patentee, title of invention, and date of this paper.

NEW BOOKS, ETC.

THE FLOODS OF THE MISSISSIPPI RIVER. Including an account of their principal causes and effects, and a description of the levee system and other means proposed and tried for the control of the river, with a particular account of the great flood of 1897. By William Starling. New York: The Engineering News Publishing Company. 1897. Pp. 57. Price 50 cents.

The author of this book is a civil engineer of reputation and has held for many years the position of chief engineer of the Lower Yazoo levee district, and is, therefore, specially competent to discuss the subject on which he writes. The work will be of no small public benefit in disseminating a higher knowledge of the conditions which confront the dwellers in the Lower Mississippi.

A DESCRIPTIVE CATALOGUE OF USEFUL FIBER PLANTS OF THE WORLD. Including the structural and economic classifications of fibers. By Charles Richards Dodge. Washington: United States Department of Agriculture. 1897. Pp. 361.

The fiber investigations of the Department of Agriculture have been recognized as of the utmost importance, and the present descriptive catalogue of useful fiber plants is one of the most creditable books which has been issued by the Department of Agriculture. The Dodge

pamphlets on fibers are of acknowledged authority and the present work admirably supplements them. The fibers are arranged in alphabetical order and the monograph has 103 illustrations and 11 plates.

We have received the "Marine Number" of Cassier's Magazine. It is one of the finest specimens of scientific and technical journalism we have ever seen. It consists of more than 300 reading pages, which are embellished with beautiful engravings, largely half tones, which are almost uniformly good. The entire number is printed on coated paper, bringing out the finest detail of the engravings. The reading matter is contributed by specialists, which include Sir William Henry White, A. F. Yarrow, Robert Caird, John U. Thornycroft, Sir Charles W. Dilke, John P. Holland, and others. We have no hesitation in commending this splendid number most heartily to all who are in any way interested in naval engineering. The price is 50 cents.

We have received the new 1897 "Circular of Information" of the International Correspondence School, of Scranton, Pa. This catalogue gives an excellent idea of the work which has been done by the students and the courses which they may take. Education by correspondence is now an assured success, and no student, even in far away country towns, need now be cut off from educational opportunities by reason of his isolation. It is a curious fact that the students of the International Correspondence Schools come from 45 different countries. For instance, there are 22 students in Japan and 17 in the South African republics. The new prospectus is very well calculated to give the reader the salient features of the system.

SCIENTIFIC AMERICAN BUILDING EDITION

SEPTEMBER, 1897.—(No. 143.)

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- No. 1. Plate in colors, also another perspective elevation and floor plans of a residence at Bensonhurst, L. I., recently erected for Mr. Walter Jones. A design treated in an attractive style of architecture, with Colonial feeling and classic detail. Architect and builder, Mr. Walter Jones.
No. 2. A Colonial residence at Springfield, Mass., recently completed for Mr. N. N. Fowler, at a cost of \$13,000 complete. Two perspective elevations and floor plans. Mr. Guy Kirkham, architect, Springfield, Mass.
No. 3. Residence at Scranton, Pa., recently erected for Mr. Thomas R. Brooks. A unique design. Two perspective elevations and floor plans. Mr. John A. Duckworth, architect, Scranton, Pa.
No. 4. Elm Park Methodist Episcopal church and parsonage at Scranton, Pa. Two perspective elevations and floor plans, also two perspective elevations of the parsonage, with floor plans. Architects, Messrs. George W. Kramer & Co., New York City.
No. 5. English dwelling at Overbrook, Pa., recently erected for Mr. Smucker. An attractive design treated in the English style, half timber and stone. Perspective elevation and floor plans, also interior view. Architect, Mr. William L. Price, Philadelphia, Pa.
No. 6. Cottage at Binghamton, N. Y., recently erected for Mr. G. N. North, at a cost of \$3,200. Two perspective elevations and floor plans. A design with many excellent features, good elevations and well arranged plans. Mr. Alfred Bartoo, architect, Binghamton, N. Y.
No. 7. Modern cottage at Nyack, N. Y., recently erected for the Rev. Edward Mitchell, at a cost of \$2,500 complete. Two perspective elevations and floor plans. A unique design for small cottage. Mr. George F. Morse, architect, Nyack, N. Y.
No. 8. Modern suburban villa at Chestnut Hill, Mass., erected for Messrs. Merriam, Isbenbeck & Alvord. A design well treated in the modern American style with Colonial detail. Two perspective elevations and floor plans. Architect, Mr. J. H. Morse, Boston, Mass.
No. 9. A residence at Binghamton, N. Y., recently erected for Miss Q. M. French. Perspective elevation and floor plans. A very attractive design with excellent elevations.
No. 10. An actress' home at Chevy Chase, Md., illustrating the residence of Miss Annie Lewis. Two perspective elevations and floor plans. Mr. Louis D. Meline, architect, Chevy Chase, Md.
No. 11. Half page design of the New Rathapotheke in Bremen.
No. 12. Pulpit of the Cathedral of Sainte Gudule, Brussels.
No. 13. Miscellaneous Contents: New York as a furniture market.—Advantages of fresh air in apartments.—Exterior plaster for dwellings.—Rules for making good mortar.—Premature occupation of new homes; a test for relative humidity of habitable apartments.—Ventilation of apartments.—Does your faucet leak?—A new recording thermometer, illustrated.—Beautiful work in wood finishing.—Slate roofs.—Deco-re-co, illustrated.—Berkfeld filter, illustrated.

The Scientific American Building Edition is issued monthly. \$2.50 a year. Single copies, 25 cents. Thirty-two large quarto pages, forming a large and splendid MAGAZINE OF ARCHITECTURE, richly adorned with elegant plates and fine engravings, illustrating the most interesting examples of Modern Architectural Construction and allied subjects. All who contemplate building, or improving homes or structures of any kind, have in this handsome work an almost endless series of the latest and best examples from which to make selections, thus saving time and money.

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Business and Personal.

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Improved Bicycle Machinery of every description. The Garvin Machine Co., Spring and Varick Sts., N. Y.
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The celebrated "Hornsby-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.

Notes & Queries

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. 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.

(7204) E. T. H. writes: The SUPPLEMENT containing description of Aeolian harps (No. 483) which you sent me is at hand. Will you kindly inform me through your Notes and Queries the best strings to use in the construction of the Frost & Kastner improved harp described on page 7715 of that number? The article simply says catgut. Is small, as the E string of a guitar, or heavy, as F of the same instrument, preferable? Also which gives the more desirable tone—the harp with strings tuned all in unison or to the octave? A. The strings of an Aeolian harp are usually of fine catgut, tuned in unison, and of equal length. The varying force of the air causes them to divide into segments, and thus to produce the tones of the harmonic series. It is doubtful if the wind could start a string coarse enough to make a tone an octave below, or one strained tight enough to produce the octave above. It is, however, an experiment easily tried by our correspondent.

(7205) G. K. P. asks: How much spark and how many ounces of wire will it take to make an induction coil the same size of illustration in SUPPLEMENT, No. 160, which you say is one-half size of directions given? A. From 1/4 to 1/2 as much wire in secondary. If you reduce core and primary coil in proportion, you will probably obtain 1/2 as long a spark with the same battery power.

TO INVENTORS.

An experience of nearly fifty 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

AUGUST 31, 1897,

AND EACH BEARING THAT DATE.

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

- Air brake alarm clock, A. McIntosh..... 589,265
Air compressing apparatus, E. C. Nichols..... 589,190
Alarm. See Electric alarm. Fire alarm.
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