RECENTLY PATENTED INVENTIONS.

Agricultural.

CULTIVATOR. — William F. Berry, Blanchard, Iowa. This is a machine which can be readily adapted for cultivating corn or potatoes, or plowing in wheat or small grain, the cultivator blades being adjustable to one side of the shaft or the other, to control the throwing of the dirt either way.

CHECK ROWER. — George L. Banks, Fall River, Kansas. This is a check rowing attachment for planters, which may be expeditiously reversed from side to side, and readily manipulated, the invention covering a novel construction and combination of parts designed to afford a simple and very effective device.

SEED GRADER.—William Minnigh, Bradleytown, Pa. This invention covers a novel construction and combination of parts in a simple and durable apparatus designed to effectually remove the larger cockle from wheat, and sort and grade the sound grain, the device having a casing and fan with longitudinally adjustable sorting chamber having a series of compartments, and other peculiar features.

STALK PULLER.—George W. Rogers, Baltimore, Md. This is a device having an extracting wheel mounted in a suitable frame, whereby, when the apparatus is driven over the rows, it will effectually clear the ground of all stalks of cotton or corn, and leave the field in proper condition for the plowing and sowing of another crop.

TRACTION WHEEL.—Le Roy O. Drew, Carthage, Dakota Ter. This is a wheel adapted to mowing machines, reapers, and other vehicles, and is made with an endless chain consisting of a series of pivoted links, each provided with parallel track plates, supported upon a frame, one link after another passing down on to the ground in front as the machine is drawn forward.

HOE.—Robert McCullough Brown, Fort Gaines, Ga. This invention covers an improvement in hand hoes to be used in cultivating gardens, and has a blade whose cutting edge is curved downward, while its shank extends rearward in the same plane with the blade, whereby it is adapted to take into the soil when the hoe is drawn forward and ride over the soil when the hoe is pushed backward.

HAY OR GRAIN FORK.—William H. Lander, Pendleton, Oregon. This fork has a cross head with pivoted clutch hooks, and a trip block above provided with a hook catch and trigger with trigger rope, with other ropes, for loading hay or grain upon a stack or wagon, or into the upper story of a barn, by means of a derrick.

Mechanical.

MINING DRILL.—William H. Jenkins, Philadelphia, Pa. Combined with a drill rod having a lifting pin is a novel form of operating cam, with other novel features, making a drill of great capacity, with mechanism for operating it of such character as to adapt the drill to all classes and conditions of rock, in which it is readily adjustable, the invention being an improvement on a former patented invention of the same inventor.

SHARPENING GIN SAWS.—William Behan and Paul Friensehner, Texarkana, Ark. This invention provides a feeding device for the teeth independent of the filing devices covered in a patent formerly issued to the same inventors, whereby the teeth of saws of varying diameters will be properly fed to give regular and uniform size to each tooth without reference to the number of teeth in the saw.

FURNACE. — Fradelshon Harris, St. Louis, Mo. This furnace is constructed with a water-containing vessel arranged adjacent to the fire chamber, in connection with an air blast adapted to force the vapors into the fire, whereby hot air with water vapor will be decomposed by the heat in the furnace, setting free hydrogen gas to render the carbon of the fuel more available in combination with oxygen.

SEWING MACHINE.—James B. Ivey, Macon, Ga. The machine has a frame adapted to support a reciprocating carriage provided with a fixed jaw and a movable jaw, a treadle or operating device, and other novel mechanism, the saw being designed principally for use in cross-cutting wood billets for chopping to make kindling wood.

WRENCH.—Charles H. Kennedy, Greenburg, N. Y. This invention provides a tool more particularly adapted for use by telegraph and other line wire men, which, while being compact as a small wrench, will also serve as a pair of nippers and a wire-cutting tool.

MOULDING.—Edward Reddy, Little Falls, N. Y. This invention covers an apparatus for making moulds consisting of inner and top and bottom frames adapted to be placed together, in combination with plates to hold the patterns and to be held between the frames for forming the mould, and to be removed from the frames for drawing the patterns.

Railway Appliances.

CAR COUPLING. — James Mutton, Frisco, Utah Ter. Each link consists of a rectangular shaped bar with an arrow shaped head, the inner end of the link passing over a friction roller and reciprocating between blocks, while a guide plate is secured thereto, the coupling being automatically effected whether an approaching link passes over or above the opposing link.

RAILROAD SWITCH. -- John Hunter, Maple Bay, Minn. This is a switch which may be automatically operated by the engineer from the cab of the locomotive, the pivoted switch rails having a rack connecting their free ends, the gear of a rock shaft engaging the rack, and vertically movable plates mounted outside the main rails being connected with the operating shaft for rocking it in opposite directions.

Miscellaneous.

SHUTTER BOWER. — John J. Taylor, Philadelphia, Pa. This invention covers a novel construction and combination of parts in a combined shutter hinge and holder which is readily applicable to ordinary windows and shutters, while it is simple, strong, and efficient.

FIFTH WHEEL.—John M. Giraud, Warwick, Md. This invention provides a broad fifth wheel designed to obviate tilting or rocking from any unequal disposition of the load, and one which will be less exposed to dust, sand, etc., than those of the ordinary construction, while no king bolt is needed, and the device is designed to be very durable.

SOUNDER ATTACHMENT.—George H. Carey and William McArthur, Dollarville, Mich. This is a resonator for telegraph relays, to amplify the sounds of the armature lever, combining with a relay or sounder a box of resonant material supported over the armature lever in position to receive its blows, the resonator being made adjustable to be accommodated to the position of the armature lever.

TRUSS.—Joseph R. Meloney, Bloomer, Wis. This device, while intended for use as a simple and effective truss, is designed to readily yield in conformity to the actions of the body, or the parts with which it is brought into contact, the invention covering various novel features and combinations of parts.

BOSOM PAD.—Edward K. Warren and Joseph H. Ames, Three Oaks, Mich. This is a dress and garment form consisting of a covering or facing of cloth of single thickness, having stitched pocket-like plaits in which are placed elastic ribs made of material that will not corrode, the whole being drawn together and a marginal binder applied to the gathered portions.

SHIRT IRONING TABLE. — James H. Mount, Jamesburg, N. J. This invention provides a shirt ironing board to be permanently or detachably connected with the table, and having yoke and shirt clamping devices, with neck band shaping device, designed to have greater durability, effectiveness, and convenience than ordinarily possessed by devices of this character,

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FEBRUARY NUMBER.—(No. 40.)

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1. Elegant plate in colors showing elevation in perspective of a suburban club house, with floor plans, sketch of entrance, etc. Munn & Co., architects, New York.
2. Plate in colors showing perspective and plans, with details, for a comfortable country dwelling. Cost three thousand five hundred dollars. Designed by Munn & Co., architects, New York.
3. View of the Jay Gould tomb at Woodlawn cemetery, near New York city. A most classical specimen of mortuary architecture.
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5. A Queen Anne cottage at Flatbush, Long Island. Cost complete, eight thousand dollars. Plans and perspective.
6. A carriage house for one thousand dollars, lately built at Flatbush, Long Island. Perspective and floor plan.
7. A house for three thousand dollars lately erected at Bridgeport, Conn. Perspective elevation and floor plans.
8. A residence at Orange, N. J. Cost fourteen thousand dollars. Plans and perspective.
9. A block of eighteen hundred dollar frame dwellings at Syracuse, N. Y. Floor plans and perspective.
10. The Galliera Museum, Paris. Half page engraving.
11. Sketches from the Architectural League Exhibition: Proposed memorial campanile for plaza of Prospect Park, Brooklyn, N. Y., Henry O. Avery, architect—The Washington Hotel, Kansas City, Mo., Bruce Price, architect, N. Y.—Towers of hotel at Big Stone Gap, Va., Brunner & Tryon, architects—District school house at Washington, Conn., Rossiter & Wright, architects.
12. Design for a boat house of moderate cost, by Munn & Co., architects, New York.
13. Page of engravings of country residences.
14. Miscellaneous Contents: Restoration of the Doge's Palace.—The broken timber raft.—Raising columns of St. Isaac's Cathedral, St. Petersburg.—Tarred bricks.—Pompeian houses. — Repairing of a well.—Finish for pine.—Architecture as a profession.—Paintwork.—The National Association of Builders.—How best to light our country homes and resorts, illustrations.—Larch lumber.—The Thomson-Houston motor for street cars.—Hints on plumbing and cellars.—The fatal climate of Panama.—Improved hoist for passenger or freight elevators, illustrated.—Clark's new anti-friction caster, illustrated.—Tool cabinet, illustrated.—Universal bevel protractor, illustrated.—California slate.—Pipe wrench, illustrated.—The "Gorton" boiler, illustrated.

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Notes & Queries

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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.

(337) B. U., Miles City, M. T., writes: Inclosed please find a copy of analysis of the water we are using for our boiler. It is taken out of an artesian well which we dug to a depth of 258 feet. Before doing so, we were using water from driven wells, but on account of coating boiler badly we had to discontinue it. Boiler about two weeks after using artesian water was perfectly clear of all scales and is like new now. To feed boiler we are using a Monitor injector, which has worked very satisfactorily right along, but commenced to trouble, losing water through the overflow, and finally got so bad that we put on a new one, which after two weeks' use commenced the same things, and is now getting worse fast. There is no sign of any sediment on inside of injector, and so I came to the conclusion that the fault must lie in the water. Now, will you have the kindness to tell me how to remedy the evil, if it can be done, or recommend an injector that will work the water we are using? Also please inform us whether the water is apt to have any bad effects on boiler.

	Grains per gal. of 231 cub. in.
Silica	1·36
Peroxide of iron	0·54
Carbonate of lime	2·27
" " magnesia	1·83
Chloride of sodium	2·01
Sulphate of soda	1·80
Carbonate " "	60·40
	70·21

A. There is nothing shown in the analysis of the water that would injure the injector. Examine the water from the well for sand, by settling in a barrel or tank, also examine the inside of injector nozzles for marks of cutting, probably by sand. You may also look for sand in the bottom of the boiler. It takes but little sand to spoil an injector. If sand is found, feed the injector from a settling tank. The boiler should be often blown down to prevent accumulation of solids. The water is harmless in its action upon the boiler.

(338) A. P. B., Fort Madison, Iowa, writes: We have recently completed an artesian well at our mill here, and would like to know if the water (which rushes out at the surface at the rate of 476 gallons per minute and shows a pressure of 111 pounds per square inch) would be injurious to our boilers, brass fittings, iron and copper piping, etc.? Below I give you an analysis of its contents as furnished by an expert chemist:

	Grains per U. S. gallon.
Organic matter	0·180
Silica	0·390
Aluminum and iron oxide	0·807
Bicarbonate of lime	14·318
" " magnesia	7·817
Sulphate of lime	10·217
" " soda	40·071
Chloride of "	41·329
Total solids	151·129
Chlorine combined	24·940

A. The total solid constituents, amounting to nearly 10 per cent of the solid constituents of sea water, will make it necessary to blow off the boiler often and in larger quantities than when good water is used. There is nothing in the water that is injurious to the boiler. Wherever there are leaks, as about the water gauge, gauge cocks, etc., there an incrustation will form on the outside by evaporation. That will also be harmless, and may need often cleaning.

(339) I. B., Leadville, asks: What is the breaking torsion strain on a wrought iron pipe three and one-half inches outside diameter with metal twenty one-hundredths of an inch thick, and one hundred feet long, fastened at one end and the strain applied at the other end? A. The torsional strength of 3 inch wrought iron pipe, 3½ inches outside diameter, is 1,392 pounds at 5 feet from the center. When coupled in a length of several pieces by welding, a deduction of 5 to 10 per cent should be made in the above figures; when coupled with the ordinary screw couplings, at least 50 per cent should be deducted for the value of the joints.

(340) G. S. writes: I have made a simple electric motor. In running it with battery need I make a new solution every time I run the battery down, and how must I connect the cell? A. The simple plunge battery described in SCIENTIFIC AMERICAN, August 20, 1887, will run the motor very well. A new solution is necessary every time it runs down. Connect the cells in series.

(341) E. L. D. asks: 1. How can I melt and make a moulding of hard rubber, such as combs, handles, etc.? A. You must use unvulcanized India rubber, and vulcanize it after shaping. See SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 249, 251, 252, which we can send you for ten cents each. 2. Is the spark which sometimes flies off from a man's shoe in striking a walk of stone or any hard substance an electric spark, or is it merely the heat generated by friction? A. The spark is a little fragment of burning iron, detached from a nail in the shoe, by striking the stone and becoming ignited by the heat of friction and impact.

(342) F. G. G. asks: 1. Can electricity be obtained in placing a dynamo in a glass inclosure with all atmosphere taken out? A. Yes. The atmosphere has nothing to do with the action of a dynamo. 2. Can a current of electricity and magnetism be sent through fire, or will it destroy same? A. Induction from a magnet or electric wire can act through fire. There is no such thing as a current of magnetism. A current of electricity needs a conductor, and flame is an exceedingly poor one. The static discharge affects a flame by creating draughts of air.

(343) J. M. H. asks for a formula for writing in white ink on blue paper or any other paper. A. Mix Chinese white with gum arabic solution. This will give a solid body ink. Or use oxalic acid, and upon the proper kind of blue paper this will give a very excellent effect by bleaching the paper. Blue paper adapted for the latter can be found upon the market.

(344) J. J. D. writes: The chord of circle being given, with the distance at center of chord to the circumference (versed sine), how can you find the radius of the circle? A. Add the squares of the versed sine and of half the chord, divide the sum by twice the versed sine, and the quotient will be the radius.

(345) A. R. asks: 1. Will benzine weaken a cord of catgut? A. No. 2. Can any oil or substance be used to replace that dissolved by the benzine? A. Olive or sweet almond oil.

(346) M. & A. write: Could you kindly inform us what is put into gelatine used for moulds to prevent the plaster from burning? A. Oil the gelatine with linseed oil. You can also mix the gelatine with one tenth bichromate of potash and then dissolve in an obscurely lighted room. Make your moulds from this and expose to sunlight.

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