becently 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
rrain, the cultivator blades being adjuatable to one side of the shaft or the other, being adjustable to one side of the shaft or t.
to control the throwing of the dirt either way.
Check Rower. - George L. Banks, Fall River, Kansas. Thisis a check rowing attachment for planters, which may be expeditiously reversed from
side to side, and readily manipulated, the invention side to side, and readily manipulated, the invention
covering a novel construction and combination of parts Seed Grader.-William Minnigh, Bradleytown, Pa. This invention covers a novel con struction 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 longi-
tudinally adjustable sorting chamber having a series of codinally adjustable sorting chamber havin
Stale 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
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 madewith an endless chain consisting of a series of
pivoted links, each provided with parallel track plates, pivoted links, each provided with parallel track piates, down on to the ground in front as the machine is drawn

Hoe.-Robert McCullough Brown, Fort Gaines, Ga. This invention covers an improvement in lade whose cutting edge is curved downward, while it hank 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 widh pivoted clutch hooks, and a trip block above pro-
vided 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 mechanism for operating it of such character as to mechanism for operating it of such character as
adapt the drill to all classes nnd conditions of rock, in which it is readily adjustable, the invention being an
improvement on a former patented invention of the improvement
same inventor
Sharpening Gin Saws.-William Behan and Paul Friensehner, Texarkana, Ark. This invention provides a feeding device for the teeth inde pendent of the filing devices covered in a paten formerly issued to the same inventors, whereby the
teeth of saws of varying diameters will be properly fed teeth of saws of varying diameters will be properly fed
to give regular and aniform size to each tooth withou to give regular and nniform size to each toot
ref erence 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 in connection with an air blast adapted to force th vapors into be decomposed by the heat in the furnace, setting
will free hydrogengas to render the carbon of the fuel more available in combination with oxygen
Sewing Machine.-Jauses B. Ivey, Macon, Ga. The machine has a frame adapted to sup port a reciprocating carriage provided with a fixed jaw
and a movable jaw, a treadle or operating device, and and a movable jaw, a treadle or operating device, and cipally for use in cross-cutting wood billets for chop-
Wrench.-Charles H. Kennedy, Greenburg, N. Y. This invention provides a tool more par ticularly 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 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 the frames for forming the mould, and to
from the frames for drawing the patterns.

## Railway Appliances.

Car Coupling. - James Mutton, Frisco, Utah Ter. Each link consists of a rectangula shaped bar with an arrow shaped head, the inner en
of the link passing over a friction roller and recipro cating between blocks, while a guide plate is secure thereto, the coupling being automatically effected whether an approaching link 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 necting their free ends, the gear of a rock shaft engaging the rack, and vertically movable plates mounted ing shaft for rocking it in opposite directions.

Shutter Bower. - John J. Taylor Philadelphia, Pa. This invention covers a novel conshutter hinge and holder which is readily applicable ordinary windows and shutters, while it is simple, rong, and efficient.
Fifth ${ }^{W}$ Weel.-John M. Giraud, War wick, Md. This invention provides a broad fifth whee designed to obviate tilting or rocking from any unequa disposition of the load, and one which will be less ex posed to dust, sand, etc., than those of the ordinary con-
struction, while no king bolt is needed, is designed to be very durable.
Sounder Attachment.-George H SOUNDER ATTACHMENT.-George H.
Carey and William McArthur, Dollarville, Mich. This Carey and wimam McArthur, Dollarvilhe, Mich. This 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 co formity to the actions of the body, or the parts with which it is brought into contact, the invention coverin Bosom Pad-Edward K W 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 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 materia 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, und having yoke and shir clamping devices, with neck band shaping device designed to have greater durability, effectiveness, and
convenience than ordinarily possessed by devices of convenience ther
this character,

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## BUILDINGEDITION.

## FEBRUARY NUMBER.-(No. 40.)

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Elegant plate in colors showing elevation in per-
spective of a suburban club house, with fioor plans, sketch of entrance, etc. Munn \& Co., architects, New York
Plate in colors showing perspective and plans, with details, for a comfortable country dwelling. Cost
three thousand five hundred dollars. Designed by three thousand five hundred dollars.
Munn \& Co., architects, New York.
3. View of the Jay Gould tomb at Woodlawn ceme tery, near New York city. A most classical spec men of mortuary architecture.
A residence at Rutherford, N. J. Perspective elevation and fioor plans.
A Queen Anne cottage at Flatbush, Long Island. Cost comple
A carriage house for one thousand dollars, lately built at Flatbush, Long Island. Perspective and fioor plan.
A house for three thousand dollars lately erected at Bridge
plans.
8. A residence at Orange, N. J. Cost fourteen thouA residence at Orange, N. J. Cost fo
sand dollars. Plans and perspective.
A block of eighteen hundred dollar frame dwellings at Syracuse, N. Y. Floor plans and perspective.
The Galliera Museum, Paris. Half page engrav ing.
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etches from the Architectural League Exhibition: Proposed memorial campanile for plaza of Pros-tcct-7'he 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. Isaae's Cathedral, St. Peters-
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or freight elevators, illustrated.-Clark's new anti friction caster, illustrated.-Tool cahinet, illus trated.-Universal bevel protractor, illustrated.California Blate.-Pipe wrenc
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to may be had at the office. Price 10 cents each. Books referred to promptly supplied on recelpt
price.
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marked or labeled.
(337) B. U., Miles City, M. T., writes Inclosed please find a copy of analysis of the water we ar 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 fectly 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 overfiow, and finally got so bad that we put on a new one, which after two weeks
use commenced the same things, and is now gettin ase commenced the same things, and is now getting
worse fast. There is no sign of any sediment on insid of injector, and so I came to the conclusion that the
adness to tel! me how to remedy the evil, if it can be onc, or recommend an injector that will work the the water is apt to have any bad effects on boiler.

Grains per gal.
of 231 cub. in.

## Silica............. ... Peroxide of iron... Carbonate of lime

Chloride of sodium.
Sulphate of soda

| 0.54 |
| :---: |
| $2 \cdot 27$ |
| 1.83 |
| 2.01 |
| 1.80 |
| $.60 \cdot 40$ |
| 70.21 |

A. There is nothing shown in the analysis of the water rom 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 and to spoil aninjector. If sand is found, feed the injector from a settling tank. The boiler should be often blown down to prevent accumulation of solids. The
(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 galons per minute and shows a pressure of 111 pounds per quare inch) would be injurious to our boilers, brass n analysi of its conperts as furnished by in you chemist:

|  | U. S. gall |
| :---: | :---: |
| Organic matter. | . 0.180 |
| Silica | 0-390 |
| Aluminum and iron oxide. | 0.807 |
| Bicarbonate of lime....... | $\begin{aligned} & . \\ & \begin{array}{l} 14: 318 \\ . \quad 7817 \end{array} \end{aligned}$ |
| Sulphate of lime. | $\begin{aligned} & . .10217 \\ & \text {. } 40.071 \end{aligned}$ |
| Chloride of | 41329 |
| Total | . $151 \cdot 129$ |
| Chlorine combined | $24 \cdot 940$ |

The total solid constituents, amounting to nearly 10 per cent of the solid constituents of sea water, will make it uecessary 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 boiter. is nothing in the water that is injurious to the boiter.
Wherever there are leaks, as about the water gauge, Wherever there are leaks, as about the water gauge,
gauge cocks, etc., there an incrustation will form on auge cocks, etc., there an incrustation will form on
the outside by evaporation. That will also be harmthe outside by evaporation. That
less, 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 ong, fastened at one end and the strain applied at
he other endf $A$. The torsional strength of. 3 ineh he other endf A. The torsional strength of 3 ineh wrought iron pipe, 31/ inches outside dameter, is
1,392 pounds at 5 feet from the center. When coupled in a length of several pieces by welding, a dednction of 5 to 10 per cent should be made in the above figures; when coupled with the ordinary screw coup-
linge, at least 50 per cent should be deducted for the linge, at least 50 per cent should be deducted for the
(340) G. S. writes : I have made a simle electric motor. In running it with battery need I nake a new solution every time I run the battery down,
and how must I connect the cellp 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. Consolution is necessary .e
nect 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. Pu. You must use unvulcanized India
rubber, and vulcanize it after shaping. See Scientific Americas Suppizent American Supplement, Nos. 249, 251,252, which we can
send you for ten cents each. 2. Is the spark which ometimes fies 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
coming 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 . Cana current of electricity and magnetism ine setion from a magnet or electric wire can act through fire There is no such thing as a current of magnetism. n exceedingly poor one. The static discharge affects fiame by creating draughts of uir.
(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. Thi
will give a solid hody ink. Or use oxalic acid, and upon the proper kind of blue paper this will give a very ex cellent effect by bleaching the paper. Blue paper dapted for the latter can be found upon the market. (344) J. J. D. writes : The chord of cirde being given, with the distance at center of chord to
he 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
(345) A. R. asks : 1. Will benzine weaken cord of:catgut? A. No. 2. Can any oil or substance be used to replace that dis
Olive or sweet almond oil
(346) M. \& A. write : Could you kindly nform us what is put into gelatine used for moulds to ith linseed plaster from burning? A. Oil the gelatine ne tenth bichro You can also mix the gelatinowith one tenth bichromate of potash and then dissolve in
an obscarely lighted room. Make your moulds from
this and expose to sunlight.

