## RECENTLY PATENTED INVENTIONS. Engineering

Rotary Engine. - Oscar E. Morse, Dillon, Montana. A piston carrier in which are trans versely reciprocating pistons is mounter in the steam cyl-
inder of this engine, the reciprocation of the pistons beinder of this engine, the reciprocation of the pistons be-
ing caused by fixed eccentrics and eccentric plates during the rotary motion of the carrier. The pistons are rothem at all times at a certain distance from their axes, producing a steady and even motion, and an automatic governor admits more or less steam as the speed ingovernor admits mo
creases or decreaces.

Railway Appliances.
CAR FENDER.-Mariano Sparmo, New York City. This fender is so constructed that an object falling on its bed causes the front end to rise and prevent
the object from rolling off, side and guard rails also cothe object from roling off, side and guard rails also co-
operating to this end, and there being at the front of the dashboard a buffer to prevent injurs to persons caughon
the fender. A rock shaft operates a forward pivoted
fender section and spring-controlled slides operate the fender section and spring-controlled slides operate the rock shaft when a body falls on the bed, latches engaging
the slides. The fender may be applied to any car without interfering with its brake or motor mechanism, and when
not in use the fender may be slid beneath the car out of not in use
Platform Dumping Car. - Scott Webber, Pigeon Cove, Mass. This car is especially de-
signed for dumping heavy material, as stone blocks a signed for dumping heavy material, as stone blocks, a
siitable distance from the side of the track, and the car shitable distance from the side of the track, and the car
has two trucks, a drawbar having swivel connection with each of the trucks. A rocker bed on each of the trucks isengaged by rockers on the platform, blocks being normally engaged between the rockers and their beds at each
side, and mechanism being provided for moving the side, and mechanism being provided for moving the
blocks of each side. On the drawbar are rubbing plates blocks of each side. On the drawbar are rubbing plates
engaging opposite sides of the rockers and rocker beds engaging opposite sides
Air Brake Device.-Earl B. Stoner, Seaside, Oregon. This is an attachment for angle cocks,
comprising a box or casing inclosing an automatic valve. iome device. It is antatic check valve attachment for the train pipe of a Westinghouse air brake system, permitting the passage of air around the angle or stopcock of the pipe when closed, so that the engineer is able to retain control of the system, even if the angle cock be
carelessly or maliciouslymanipulated, thus preventing air from being shut off from the car solong as the hose is
Berth STEP.-Alfred E. Crow, New
York. This inventor provides a simple device for use in York. This inventor provides a simple device for use in
reaching the upper berths of sleeping cars and vessels, consisting of a swinging frame, adapted when not in use
to close into a recess of a berth rail, and so be entirely out of the way. A series of folding steps fold into the rail with the frame, the steps dropping automatically into position when the frame is swung open, and the steps
being so connected with the frame that when the latter being so connected with the frame that when the latter
is swung up the steps will be automatically folded to enis swung up the steps will
Station Indicator. - Gustav Tresenreuter, Berlin, Germany. This is a device for use on
the cars of street railways to indicate different points or crossings along the line. The indicator, carrying an end-
less band on which are marked the different stations, in a suitable casing, is driven by the movement of the car wheels, and means are provided, should the wheels slip on the track, for conveniently readjusting the me-
chanism. The device is very simple and inexpensive, chanism. The device is very simple and inexpensive,
and may be ordinarily operated without requiring any atention from the conductor
Mail Crane.-Erastus L. Peirce, Topeka, Kansas. Upon an upright post at the side of the
track are two pivoted arme, between which the top and bottom of the mail sack is removably secured, the upper arm having a straight extension beyond the pivotal point
and the lower arm a cranked extension, and these extensions being connected by a rod. When the arms are
swung down they take up but little room, and the mail ag may be conveniently secured to them and the arms swung up, without requiring a platform for the mail carricr to stand on while adjusting the pouch.

## Electrical.

Automatic Alarm.-George B. Will-: iams, Texarkana, Texas. This is a device, more espe-
cially adapted for employment in connection with dry pipe sprinkler systems for protection against fre the pipe sprinkler systems for protection against fire, the
alarm giving warning when the air pressure in the pipes falls below a certain point. Thealarm indicates first the fall of the air pressure, and afterward gives warnins
when the water has entered the pipes of the system. Different forms of contact valve are provided, and different arrangements of circuit-closing devices, for more or less
complicated systems.

Mining, Etc.
Extracting Metals from their Ores.-Henry G. Wulliams, Pueblo, Col. This inventor provides a method of and apparatus for the extraction of
metals by the chlorimation or wet process, the ore having the usual preliminary preparation, such as pulverizing, troducing the precipitating agent and an independent agitating blast of steam into the solution of metal, to secure admisture and agitation by a whirling motion and
the agglomeration of the precipitated particles of metal, ontinuously separating the precipitate by settlement and filtration.

## Mechanical.

Combination Tool-Oscar E. Morse and Everett H. Brundage. Dillon, Montana. This is a combined hatchet, hammer. and nail puller. In the head
of the tool is a recess int $\rightarrow$ which the of the tool is a recess int which the n...-pulfing device Its shank extends up a tubular opening in the handle,
where a dog pivoted in a lateral recess is adapted to en-
gage a screw in the end of the shank, locking it so it can-
not rattle.
Saw Set.-Fred W. Brown, Wolcott, N. Y. This device comprises a base to which is pivoted a movable clamping arm adapted to engage the saw, th front of the end of the clamping arm. The anvil has re cent of the end of the clamping arm. The anvil has set to a greater or less extent, and the whole device i erysimple and inespensive.
Machine Guard.-George F. Fisher North Tonawanda, N. Y. This invention relates to wood working machines, such as hand joiners, variety mould accidents to the attendants. A hooõ or guard, made in sections arranged to telescope horizontally and longitu dinally, is held above the cutter and transversely of the table, to expose more or less of the cutter and of the work
as may be necessary at one time. The hood yields readily to permit placing the work, and may be swung to one
Drill Sharpfner.-Ole Larson and John W. Carlson, Wardner, Idaho. A simple and easily "Burleigh" or grooved drills is provided by these invent ors. The drill holder is movable along a framing and is held in suitable position by a lever and detent, and there is an opening in a drill guide for the passage of the drill,
holding pieces being movable toward and from such holding pieces being movable toward and from such
opening. A handle lever is connected with an armed wheel engaging movable sharpening bits to move the lat-
Leathe
Leather Working Machine.-Robert Steyer, Dohna, Germany. For stretching, finishing
and dressing leather, this inventor provides a machine and dressing leather, this inventor provides a machine cogularly move the hide or side, in connection with a ing tools yieldingly engaging the leather to finish and stretch it.

Box Machine.-Otis A. Sanford, New-
castle, Cal. To make wooden boses rapidly and automatically, this machine comprises a mechanism to sup-
port and move the end boards, and to place and nail one side board thereon, turning the end boards with the side board through an angle of ninety degrees, then placing and nailing in position a bottom board, again turning
the box to bring the unfinished side uppermost, and the box to bring the unfinished side uppermost, and
finaly placing and nailing the second sideboard and disfharging the box from the machine, the several mechan-
chatis and isms being operated by common power.
Manufacturing Wire Bale Ties.form length without waste of material, and without undue strain or wear on the parts of the machine, this inven-
tion provides for a traveling head with a revoluble spinde for forming the twist in the end of the wire, a pair of gripping jaws holding the wire in place during the twist ing of the loop by the spindle. The wire to be formed
into ties unwinds from a spool, and passes through a to one of the heads of the machine.

## Agricultural.

Potato Cutter.-Albert J. Wood. Wilder, Kansas. For cutting potatoes for seeding purposes, or for sllcing or cutting vegetables, the potatoes
or other vegetables are fed by a vertical plunger to the knives, being automatically centered by a cradle or hopper, yet being capable of yielding to the plunger, so as not
to be unnecessarily bruised. The knife frame, with to be unnecessarily bruised. The knife frame, with a
series of knives, is removably placed in a supportin series of knives, is removably placed in a supporting
frame, a crossing knife being located below the frame knives, while the hopper over all the knives has spring-
controlled gate members, fingers entering the spaces controlled gate members, fingers entering the spaces be
tween the frame knives, between which also the plunger HEI
Heel Sweep Brace.-Augustus C. improvement comprises a brace for heel sweeps of strong improvement comprises a brace for heel sweeps of strong
and inexpensive construction, by which the wings of the sweep will he prevented from closing, and that portion of terially strengthened. The brace comprises three bars of completely adjustable character, the device being appli-
Cream SEParate kinds and sizes of sweeps.
Disks.-Willian . Bush, Battle Creek, Neb. A holder for use in cleaning these disks is provided by this improvement, the holdor supporting the disks so they may be subjected to the
action of a jet of steam and turned so that every part of the disks will be effectually cleaned. The disks are thoroughly heated to loosen the dirt, which is thrown off by the centrifugal motion as they are rotated by the steam, the heated disks drying immediately when the steam is hut off.

## Miscellaneous.

Cyclometer.-Fred M. Carroll, Union City, Pa. This is an instrument to be attached to any traveled during a specified time, and having also an independent registering device to show the distance traveled each day, the auxiliary register being independent of the
other, though operated by the same mechanism. In a suitable casing a series of recording disks are loosely mounted on a spindle, there being a worm and worm wheel from which the disk spindle is extended for actu-
ating the disks from the wheel of the vehicle while ating the disks from the wheel of the vehicle, while a
pointer mounted on the spindle travels over a dial, and registering wheels independent of the disks are operated by the pointer.
Typewriting Machine.-Horace G. Perry, Suisun City, Cal. In this machine are sets of typebars with single characters and sets with duplex or multiple characters, adapted to print short words or syl
lables, as "an," "as," "is," etc. there being an escapelables, as "an," "as," "is," etc. there being an escape-
ment device to feed the carriage ifferent distances corhe different tye space occupied by the characters on the different type bars. The improvement is designed to
afford a machine of simple and inexpensive character
which shall have certain important advantages over othe machin
nicety.

Extension Joint for Brick work. Seymour G. Smith, Plainfeld, N. J. This improvemen is especially applicable in the construction of furnaces
retorts, chimneys, etc., and all brickwork subjected to heat. It consists of placing transversely in the wall a sheet being interwoven with the brick as the differen courses are laid, so that joints are broken upwardly and in depth, the sheets thus forming a zigzag line both ver tically and transversely, and their side edges being flush
with the faces of the wall. They are preferably placed with the faces of the wall. They are preferably placed
about three feet apart in a will, thus rendering the wall sufficiently elastic
Hinge.-Edwin F. Tilley, New York City. This is an improvement in hinges not permanent they may be mounted on each other and yet be easily separated. The hinge consists of two sections, one
formed with an opening extending through it and hav formed with an opening extending through it and hav
ing closed sides, one side of the opening being beveled, ing closed sides, one side of the opening being beveled
while the other section has a tongue which fits within the opening, and has its side adjacent to the beveled side of the opening also beveled to conform to the opening side. The improvement is especially
Picture Exhibitor. - George W. Brown, Colorado Springs, Col. This is an improve
ment in devices adapted for advertising purposes, and ment in devices adapted for advertising purposes, and
comprises a revolving and endwise movable drum in a casing provided with asight aperture, there being means for rotating the drum and moving it endwise, while the
drun, when it reaches the end of its movement, stop drun, when it reaches the end of its movement, sto
automatically and returns to its original position. the surface of the drum is a spiral strip on which ma arranged pictures or printed matter

Convertible Bed and Fire Escape. -Henry Marcheter, Wallaceburg, Canada. When in metallic spring bed, forming an elastrc bed bottom when through a window to hang pendent as a ladder. improvement comprisesa number of bed sections, each consisting of two metal strips to the ends of which are secured U -shaped springs, link bars uniting the ends of
the sections, and the springs being adapted to form the sections, and the springs being
steps when the sections are unfolded.
Mop. - Eugene Stebinger, Portland, Oregon. This improvement consists of a handled roller
frame carrying a roller, there being pivoted thereon a second frame carrying a roller, the mop fabric passing between the rollers, while a mop head carrying the fatoon provides for quickly and conveniently wringing the mop fabric without using the hands directly in such work, facilitating the use of hot water, lyes, etc.
Cuff Button.-William G. Sutton, Winston, N.C. This is a button with a clamping device
adapted to engage the coat sleeve, holding the cuff always in the same position relative to the sleeve withou exposing part of the clamping device or hiding the head of the button. There are serrations on the under side of
the head at one side and a spring is extended from the shank to an engagement with the head.
Foot Brush.-Peter Morck, Chicago, III. This is an improvement in brushes adapted to en-
gage the sole of the shoe, to subject it to a scraping and a brushing action. The invention provides for stationary side brushes and a vertically movable bottom brnsh, the latter being made up of sections between
which are stationary scrapers so arranged that when the brushes are depressed the foot will rest on the scrapers. Two brush sections are preferably placed side by side,
each adapted to receive one foot. Rattle.-George C. Smith, Fishkill-on-the-Hudson, N. Y. This is a toy consisting of a rub-
ber body withelasticrings at its ends, one being a teeth ing ring, wtile the other ring embraces a rattle consist ing of a casing having inclosed balls and an exteri
groove. The device is very simple and inexpensive.
Chocolate Dipper.-Cyprien Gousset, New York City This is one of several successive
patents of the same inventor for improvements in dippatents of the same inventor for improvements in dip-
pers, for immersing candies in chocolate solutions, and provides a cheap and easily applied cover for each pocket of a dipper to prevent the displacing of the drops
or candies in the dipper during the dipping process, the or candies in the dipper during the dipping process, the
cover being of an open structure, to not interfere with cover being of an open structure, to not interfere with
completely coating the articles. The cover offers but ittle surface for the accumulation of solidified chocolate and readily closes or opens the pockets.
Oil Cloth, etc., Cutter.-James W. Lewis and Sirus E. Kochendarfer, Hollidaysburg, Pa. For cutting oil cloth, linoleum, carpets, window shades,
etc., these inventors provide a cutter of which the supetc., these inventors provide a cutter of which the support has a straight edge with a rail on its upper surface, of which projects a knife, a shoe being pivoted between the members of the frame and grooved to receive the
rail of the support, while a handle projects from the top rail of the sup
of the frame.
Wagon Brake Rod.-John W. Cook and Charles Scott, Woodburn, Oregon. This is an imthe operating lever on the box and the other end to a lever on the running gear, the rod being quickly lengthened or
shortened by an attachment consisting of two shortened by an attachment consisting of two plates or
jaws, one with studs and the other with apertures to receive the studs, there being a sleeve on the shanks of the brake rod can be easily and quickly removed to permit the removal of the bos or body from the running gear.
Lubricator for Vehicle Axles. James C. Whisman and Louis F. Gerding, St. Joseph,
Mo. According to this improvement the axle spindle has in its top a longitudinal tapering groove, in which
fits a tapering bar with a head, and a nut on the spindle
has an annular groove into which the head of the bar
projects. The lubricant is applied to the bar before its
insertion in the groove, and the bar presses the lubricant insertion in the groove, and the bar presses the lubricant
in contact with the journal or box in the hub of the the axle.

Necktie.--Pozzo Camillo, New York City. According to this improvement the ends of the covered with material similar to the tie, the dimensions of the channels and the elasticity of the clamping piece being designed to hold the clamping piece at any de-
sired place, and the neckband being thus practically ad sired place, and the neckband being thus pra.
justable to different widths of bows or scarfs.

Trousers Supporter. - Henry Shrier, New York City. This improvement is more especially designed for the use of riders of bicycles, horses,
etc., and comprises a trunks supporteryieldingly secured to the waistband of the trousers, the trunks having short leg portions with elastic bands and elastic loops for closing side openings. The supporter is designed to the leg portions of the trousers.
Awning.-James S. Sanders, Durango, Col. A frame of curved bars, according to this imserve as guides for vertical slide bars secured to the edges of the sections of the awning, one of which is se cured at each side of the window opening. The awning sections are designed to be evenly opened and closed,
as desired, by means of operating cords secured to the as desired,
slide bars.

Crude Oil Burner. - Thomas J. Brough, Baltimore. Md. For burning the heavier oils, this invention provides for a separation of the oil in the
burner itself into a lighterand easily vaporized oil and a burner itself into a lighterand easily vaporized oil and a
heavier oil to be drawn off and burned through a sepa rate nozzle or otherwise utilized. The fire chamber is composed of a series of coils, a burnerat the :ower end discharging into a central space and there being a hamber for separating the light from the heavy oil in one of the convolutions of the coils, directly within the influence of
the burner's heat, a pipe from such chamber leading ay the heavy oil.
Fence Wire Stretcher. - Hugh Robinson, Exeter, Neb. This device comprises a
toothed bar, one end of which is connected by a chain toothed bar, one end of which is connected by a chain
to the post, there being fulcrumed on the outer end of the bar a hand lever on which is a clamping device to the bar a hand lever on which is a clamping device to
engage and clamp the wire to be stretched, a link connected with the hand lever engaging the teeth of the bar. The device is very simple, can be readily attached to
the postat the desired height for the wire, and is easily the postat the desired height for
Gate.-Orville M. Blood, Elburn, Ill. This gate may be opened or closed from either side by a
person on horseback or in a vehicle. The invention provides a cheap and strong working mechanism, not liable to get out of order, there being on the gate a slide bar engaged while a brace is pivoted to the bracket and to the gate. Tilting connecting levers are arranged at right angles to the gate when closed, and an adjustable pull rod connects the levers and bracket.

## Designs.

Building Block. -George H. Bodine, Zanesville, Ohio. This block is exteriorly of rectangular
form, with plane uniform surfaces on five sides, whilc in its sixth side is a cylindrical pocket with concaved bottom.
Nore.-Copies of any of the above patents will be furnished by Munn \& Co., for 25 cents each. Please
send name of the patentee, title of invention, and date of this paper.

NEW BOOKS AND PUBLICATIONS
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ing an excellent kystem of teaching and of learning this ing an excellent system
somewhat difficult art.


This second volume of chemical technology, now issuing from the press of T. Blakiston, Son \& Company, is industry, candle manufacture, petroleum industry and lamps, and miners' safety lamps. All we can say of it is that it is 80 thorough in its treatment and so complets that it is quite futile for us to attempt to review it. The ingle volume of about 400 pages contains, on the avefillustrations alone take nearly ten pages, while an excellent index closes the work. It forms the second volume of the technology, of which the third volume is
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des minerals-Essai des alliages Paris : Librairie J B Bailliere et fils. 1896. Pp. 420. Price $\$ 1$

This nicely illustrated and well printed monograph treats of the entire subject of gold, from its mining and metallurgy to the analysis of its ores. The absence of an indes is made of but small moment by the presence of a very full table of contents. The house of Bailliére have done a great service to science in the vergextensive series
of monographs which they have issued, and the present will be accepted as by no means the least important of their series.

Heating and Ventilating Build INGS. An elementary treatise By
John Wiley \& Sons London : Chap
man \& Hall, Limited. 1895. Pp. siii, 411 Price $\$ 3$
This excellent and serious work, with numerous illus trations, tables and data, treats systematically of the sub ect even heating with electricits we mete the thelua pense of electrical heating receives due consideration, the ecessarily low efficiency of the system when the elec tricity is generated by steam plants militating strongly gainst its use. While we feel that the entire book de serves great commendation, and while it really fills a voi in technical literature, we would refer to the section de oted to electrical heating as an indication of the tely preceding the excellent index is a series of twenty ne tables of different data to be used by the engineer.

## SCIENTIFIC AMERICAN

BUILDINGEDITION

## JANUARY, 1896.-(N.. 123.

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1. A residence at Orange. N.J. Two perspective elevations and floor plans. also an interior view. Approximate cost $\$ 12,000$. Mr. Frank W. Beall, ne appropriate to the location.
2. A Colonial residence, at Springfield, Mass., recently ant for M. W. S. Scott. Two perspectiv Architect, Mr. G. W. Taylor, Boston, Mass. A artistic design.
3. A residence recently erected for Rev. S. E. Smith, at ive elevation and floor plans, Cost $\$ 7.500$ complete. Mr. A. M. Jenks, Mount Vernon, N. Y architect. An attractive design.
4. A dwelling at Hasbrouck Heights, N. J. Perspec tive elevation and floor plans. Cost complete $\$ 3,500$. S. A. Dennis, Arlington,
A modern and attractive design.
5. Two perspective elevations and floor plans of country house, at Lawrence Park, Bronzville, . Y., recently erected at a cost of $\$ 10,000$ comect. One of the most artistic and picturesque country houses in Westchester County
6. Public school No. 9, of Erie, Pa., recently erected cost of $\$ 38,000$ complete. Mr. Joseph Frank Erie, Pa., architect. The design combines a striking exterior ap
arrangement.
r. A half-timbered cottage of moderate cost recently erected at Glen Ridge, N. J. Architect, Mr. E. R. Tilton, New York City. A pleasing design.
7. A view of the Washington Arch, New York City, Designed by Mr. Stanford White, of the architectural firm of
New York City
8. View of the new Surety Building, New York City Total height from curbstone to coping, 314 feet, 0. Miscellaneous Contents: A great bell.-Calvert Vaux or the Mississippi River.-The centenary of the nstitute of France,-A new corner grate, illus. rated,-The "American Trackless " sliding door hanger.-The Handco "straight flush " closet, il-ustrated.-A simple and efficient pump, illustrated. Staining wood.-Artificial fuel.-Ancient glass makers -House numbering.-Fires in "sers.
scrapers."-Non-beat conducting coverings, trated.-Improved wood-working machinerp Dlus-

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Whereas. tbe sai
Whereas. tbe said copartnership bad business rel the State of New York for a period of five years and upward; and
Wbereas, I, Orson D. Munn. the surviving copartne said copartnership and to continue the use of the name of Munn $\&$ Co.
Now,
L Orson
Now, I. Orson D. Munn. do bereby certify and declar Co., and that my place of abode is 14 East Twent econd Street, City of New York, and tbat my principa place of business is at No. 361 Broadway, in the City an
State of New York. In presence of
A. A. Hopsins.

City and County of New York, ss On this 6tb day of January, in the year 1896. before me personally came Orson D. Munn, to me known to be the instrument and acknowledged to me that he executed the same for the purposes tberein mentioned.
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## 

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(6700) W. A. E. says : Please inform me through the columns of the Scientific American what in photography, and howit is prepared. A. Magnesium powder, 6 ounces; potassium chlorate, 12 ounces; antimony sulphide, 2 ounces; 75 to 150 grains of the powder should be used. 2. 15 graims of gun cotton and 30 grams of magnesium powder are used

## 3. Magnesium.

Permanganate of po
. ${ }^{40} \mathrm{p}$
40
4. Purchase 1 ounce of magnesium powder and 1 ounce erials. Place on a dust $n$ enough cotton, whaphic ma erials. Place on a dust pan enough cotton, when pulled
out, to measure about 348 mches im diameter. Sprinkle it over with 20 grains of magnesium powder to form a hin, even film. Lay over the magnesium thus arranged a very thin layer of gun cotton. Connect to the bunch of cotton a small fuse of twisted cotton about 6 inches long, so that it will extend to the side of the dust pan. Then set the pan on a step ladder near the object, and
when ready, light the gun cotton fuse with a match, when instantly a brilliant flash will ensue. There are several ready prepared magnesium compounds now sold with special devices and lamps to fire them.
(6701) C. W., Ontario, Canada, asks for simple method of testing drinking water. A. General Evaporate by gentle heat a small sample of the wate nearly to dryness in a clean porcelain cup, moisten the
residue with acetic acid, and add to a portion of it a few drops of strong hydrosulphuric acid-pure water saturated with the gas evolved by the action of dilute sul phuric acid on iron monosulphide; a black precipitate
indicates lead. Add to another portion of the dilute acetic acid solution a little pure hydrochloric acid ; a white precipitate which redissolves on diluting with boiling water indicates lead. To the remainder of the solution add a few drops of dilute sulphuric acid and let it stand for a time; a white, heavy preciptate indicates lead. 1. Test for Hard or SortWater.-Dissolve a fall into a glass good soap in alcohol. Let a few drops if not, it is soft. 2. Test for Earthy Matters Take litmus paper dipped in vinegar, and if, on immer
ion, the paper returns to its true shade, the water does sirup be added to a water containing an earthy matter sirup be added to a water containing an earthy matter,
it will turn green. 3. Test for Carbonic Acid.-Take equal parts of water and clear lime water. If combined or free carbonic acid is present, a precipitate is seen, which, if a few drops of muriatic acid be added, an effervescence commences. 4. Test for Magnesia.-Boil the water to a twentieth part of its weight, and then drop a ew grains of neutral carbonate of ammonia into a glass of it and a few drops of phosphate of soda. If magnesia
be present, it will fall to the bottom. 5. Test for Irona. Boil a little nutgall and add to the water. If it turns gray or slate black, iron is present. b. Dissolve a little prussiate of potash, and, if iron is present, it will turn blue. 6. Test for Lime.-Into a glass of water put two drops of ozalic acid and blow upon it. If it gets milky, lime is present. 7. Test for Acid - Take a piece of lit mus paper. If it turns red, there must be acid. If it reciplue one ? (6702) Encineer writes : Would it (6702) Engineer writes: Would it r quire more power to propel a fan in a cylinder in which inder with the air pumped out? Or, in other words, would the compressed air offer any resistance to the fan? A. Any medium that the fan revolves in offers a resistance due to the pressure:of driving the medium forward, as well also to the friction of the blades, proportional to the density of the medium. Thus a vacuum may be said to have no resistance, while air at atmospheric pressure and when compressed resists the motion of fans in pro-

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(6703) G. G. C. writes: Your answer to G. G. C. in the last edition is good so far as it goes, but if it is notasking too much, I would like to ask one or
two more questions. 1. Does temper or thickness in the bell of a steam whistle affect the sound? A. Not materially. 2. Are the air waves causing the sound produced by the vibration of the metal of which the bell is made, or by the interrupted exit of steam? A. By the futtering of the issuing steam mamly.

## TO INVENTORS, <br> An experience of nearly fifty years, and the preparation of more tban one nuandred thousand applications for oa- ents at home and abroal <br> ents at home and abroad, enable us to understand the <br>  <br> 

INDEX OF INVENTIONS
For which Letters Patent of then
United States were Granted
January 14, 1896,
AND EACH BEARING THAT DATE. (See note at end of list about copies of these patents.)


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Coan. See Cotton clean
Closet. See iartb lotet.
Cothes drier, S. B. Rotz.








