Scientific American.

Tesla's Patents Upheld.

Judge William K. Townsend recently gave, at New Haven, Conn., an opinion which upheld the Tesla electrical patents, which had been infringed upon by several parties. The decision was remarkable in view of the fact that it went outside the usual verbiage of the Court which is used in confirming the validity of patents. Judge Townsend said: "A careful study of the evidence shows that Tesla has made a brilliant discovery. It remained to the genius of Tesla to capture the unruly, unrestrained and hitherto opposing elements in the fields of nature and art, and to harness them to draw the machines of man. It was he who first showed how to transform the toy of Arago into an engine of power; the laboratory experiment of Bailey into a practically successful motor; the indicator into a driver. He first conceived the idea that the very impediments of reversal in direction, the contradictions of alternatives, might be transformed into power, producing rotations, a whirling field of force. What others looked upon as only invincible barriers, impassable currents and contradictory forces, he seized and by harmonizing their directions utilized in practical motors in distant cities the power of Niagara."

A New Double Salt of Chromium and Ammonium.

M. Charles Laurent, of Paris, has succeeded in forming a new double salt of chromium and ammonium. He describes his experiments in a paper recently presented to the Académie des Sciences. It is well known that the sulphates of the magnesium series give, with the alkaline sulphates, double salts whose type is the salt of magnesium and potassium, MgSO₄ + K₂SO₄ + 6H₂O. The only chromous salt of analogous form known at present is the double sulphate of the protoxide of chromium and of potassium, CrSO₄ + K₂SO₄ + $6\,H_2\mathrm{O}$; this salt has been prepared by Peligot. The experimenter states that he has been able to prepare another salt of the protoxide, the double sulphate of chromium and ammonium. Experiments with the chromous salts are very difficult to carry out, as in the presence of air these are soon transformed to chromic salts; all the operations must be performed in the presence of an inert gas. In this case carbonic acid gas was used. Bichromate of potassium was taken as the starting point, and from this the chromous chloride

was prepared by the usual reaction; this was transformed to acetate, which is but slightly soluble, by adding acetate of sodium in excess. The chromous acetate, freed by washing from the other salts, is decomposed by the proper quantity of dilute sulphuric acid. After having expelled the acetic acid by ebullition, the proper proportion of sulphate of ammonium is added. The liquid, by concentrating and cooling, deposits blue crystals, which are separated from the mother liquor, always out of contact with air, and dried upon kaolin. This is the double salt of chromium and ammonium; it appears in fine crystals of a blue color, resembling copper sulphate. Analysis gives the formula $CrSO_4 + (NH_4)_2SO_4 + 6H_2O$. Water dissolves this salt in considerable proportions; it possesses the reducing properties of the simple chromous salts. and in the presence of air it is transformed rapidly to the chromic salt. The difficulty of preserving it from contact with air does not permit the exact determination of its crystalline form, but by its formula and external appearance it has a close analogy with the double salts of the magnesium series. This compound, into which the protoxide of chromium enters, shows another point of resemblance between chromium and iron.

----Ordnance at the Pan-American Exposition.

The display of ordnance and war articles at the Pan-American Exposition will be a most notable one and will vary from a 12-inch rifle to a pocket emergency ration. There will be field batteries of artillery, camp equipage, machine and rapid-fire guns, torpedoes, small arms, and the shipbuilding industries will be fully represented. In fact, everything will be shown that will tend to interest foreign purchasing officers. This exhibit will be a commercial one and will be entirely distinct from the government display. Nearly all the South American countries have declared their intention to send a special commission to this country to investigate the war goods offered. It is planned to have a tunnel built under the bluff on which the ordnance will be located. Guns will be fired through this tunnel, and the conditions will approximate as much as possible those obtaining on government proving grounds. This is undoubtedly an entirely new venture for an Exposition and cannot fail to prove of the greatest interest. The firing range at Buffalo will be

over the surface of Lake Erie, and it is hoped to make a new record for long range work. The object of the display is to demonstrate to official commissions of foreign countries the great capabilities of American plants to undertake the filling of all military and naval orders of foreign States.

The Building Edition for September.

The September number of the BUILDING EDITION OF THE SCIENTIFIC AMERICAN has the usual choice selection of houses of various prices, and among the other interesting features are "The Scoville Memorial Library at Salisbury, Conn."; "A Group of Artistic Door Knockers," measured details of interior fittings, "Fireproofing Wood," and other subjects of equal interest.

The Current Supplement.

The current Supplement, No. 1289, has many papers of unusual interest. "The Proposed Abandonment of the Port Royal Naval Station" is an elaborately illustrated article dealing with the subject which is now agitating naval circles. "American Engineering Competition," the ninth number of which is published in the present issue, deals with locomotives. "The Fleet of Allied Powers in Chinese Waters" occupies an entire page. "Mechanical Stoking" begins a series on this subject. "Artillery School at Jüterbog" describes some very curious experiments which are carried on at this school. "Exchange Value of Meteorites" is by L. P. Gratacap. "The Automobile Wagon for Heavy Duty" is by Arthur Herschmann. and is fully illustrated.

Contents.

(Illustrated articles are marked with an asterisk.)
Abruzzi Expedition
tion of the state

RECENTLY PATENTED INVENTIONS. Agricultural Implements.

POULTRY NEST AND HOVER .- JOHN N. GREEN, Newtown, Ky. This portable poultry-coop is made entirely of metal, whereby the construction is less cumbrous and heavy than heretofore. The inventor has provided good ventilation. One of the novel features of the invention is a door of greater length than width. When placed in vertical position, the door prevents the hen from leaving the coop, but allows the egress of the chicks through a small opening. When placed in horizontal position, the door prevents all egress, but permits thorough ventilation,

CACTUS-BURNER.-LEWIS N. SNOWDEN, Tilden, Tex. The device is used to destroy the "spines" of the cactus or prickly-pear, so as to render it more useful as a food for cattle. Gasolene or other volatile fuel is used, which is thoroughly vaporized and burnt. The burnernozzel is so arranged that a regulated draft is created to form a hollow or annular flame which is spread over the vaporizing-coil. The down-draft blows out of the nozzletip any impurities or scales which are liable to collect therein. A hood confines the flame to the vaporizingcoil until every part has been thoroughly heated.

SEAT ATTACHMENT FOR HARROWS. - OTTO W. SKORKOWSKY, Harrah, Oklahoma Territory. It is the object of this invention to provide an improved wheeled attachment for harrows or like implements, whereby the driver's seat is carried and adapted for adjustment, so as to counterbalance the draft appliances. The improved attachment comprises two bars hinged together at their front ends and fixed to an axle which is formed of two lapped parts adapted to slide on each other. Through the axle and the seat-supporting bar, a bolt is passed, which serves to secure the axle parts and seat-bar in any adjustment.

Electrical Apparatus.

CABLE-HANGER. - CLEMENT E. BEARD, COMMbiana, Ohio. This hanger for telegraph and telephone | lock is especially adapted for use in connection with cables comprises two members pivotally connected with | switches to hold the switch-point secured, but it may be each other and provided with prongs for engaging the also used in various other connections. The lock has a cable. Hooks engage the hanger-support; and these bolt adapted to be thrown by the key. A tumbler serves hooks are arranged to overlap when the hanger is closed. To hold the holt in closed position and is also adapted to The hooks can not open accidentally; nor is the cable or its envelop liable to be marred.

ELECTRIC MOTOR.-EDWARD A. HENRY, Crestline, Kans. The motor is particularly adapted for operating vibrating fans or other devices requiring little power. In this motor the armature oscillates, for which reason the inventor was chiefly concerned with devising some simple form of controller which would periodically the attachment thereto stitches braid, chenille, tape, change the direction of the current. The current is cord, bands, or the like upon the fabric to be embroidfed by an angle-lever, the two arms of which alternately | ered in such a manner as to produce ruching or fluting engage two contact-plates connected with the arma- effects. Mechanically considered, the attachment contures. The current changes in direction as the arma- siets of a sleeve mounted to turn on a reciprocating tures reach the end of their travel.

Brooklyn, New York city. Heretofore the design to be sleeve and actuated by the reciprocating nipple to impart engraved upon a watch-case, for example, has been an intermittent rotary motion to the cam and cause a raised or produced in metal on a pattern-disk, necessi- swinging of the carrier. tating considerable work in routing out the metal around STAGE-MACHINERY.-CLAUDE L. HAGEN, Man-

or with other non-electric conducting material; or the and driving one or more traveling aprons at the rear of material which is a non-conductor of electricity. When an electric tracing-finger engages with the filling in the design, the circuit is broken and the cutting-tool

Engineering Improvements.

STEAM-JET FLUE-CLEANER. - HOOKER I. COG-GESHALL, Wortendyke, N. J. Steam of high pressure is passed through a blower-pipe into the conical head of the cleaner and highly heats the head. The pressure of spiral-wings over the head and mingled with the steamjet. As the air-current mingles with the steam, the combined jets coact to loosen and blow out the scale.

VALVE.-DAVID GILCHRIST, Concord, N. H. This valve, for use on expansion steam-engines, consists of a steam-chest connected with the ports of both the high and low pressure cylinders. A main valve, reciprocating in the steam-chest, is arranged to control the admission of the steam to the high-pressure cylinder. An intercepting-valve under control of the engineer, and operating in unison with the main valve, regulates the exhaust of both the high-pressure and the low-pressure cylinder and the admission of the live steam to the low-pressure cylinder.

VALVE.-ALBERT P. BROOMELL, York, Penn, The valve, although capable of general application, is especially designed for use in connection with a steam-heating system previously patented by Mr. Broomell. In this steam-heating system it is desirable to open a vent to the air when the steam is shut off from the radiator. The valve forming the subject of this patent is adapted to vent to the atmosphere when it is adjusted to close or shut off the port leading to the supply.

Mechanical Devices.

LOCK .- WALTER E. EMERY, West Chicago, Ill. This be thrown by the key to release the bolt. A chock-bar serves to hold the bolt in open position during certain periods of the operation of the lock. A keeper-plate fastened adjacent to the chock-bar limits its movement. CHINES. - Joseph Grubman, Brooklyn, New York place. city. The machine is of the Bonnaz or other type; and needle-bar, on which sleeve a carrier is pivoted. A re-ENGRAVING-MACHINE. - CHARLES CHEVALIER, ciprocating nipple and a cam are mounted to turn on the

made in intaglio; and the cut surface is filled with wax races on the stage. It embodies means for mounting ment.

design is drawn or painted on the pattern-disk with a the stage, so as to represent the background of the scene, which gives the spectators the impression that the horses are moving forward. The apparatus was very successfully used in the play "Ben Hur," produced in New York city, and was fully described in the Scien-TIFIC AMERICAN for August 25, 1900.

APPARATUS FOR REMOVING MATERIAL FROM | railway rolling-stock. BELOW THE SURFACE. - HERBERT F. MUNN, 56 Beaver Street, Manhattan, New York city. Upon the deck of a vessel a compressor is mounted, which forces air downwardly through a pipe leading to the gold-bearing sands in a river-bed. The nozzle of this air-pipe is the steam causes a current of air to be drawn between hinged so that it can be controlled from the deck of the vessel. The compressed air forces the sand through a second pipe adjacent to the first and discharging in a tank on the vessel. The arrangement has decided merits. In the first place, the gold-bearing sand is directly reached without removing the worthless superimposed strata; and, in the second place, the hingednozzle can be readily controlled properly to discharge the loosened material into the second pipe,

> DEVICE FOR FILLING AND SHAPING CUSH-IONS.—FANNIE L. MYERS, 47 Great Jones Street, Manhattan, New York city. Toilet or pin-cushions are held in a mold or shaping-block and the filling quickly packed therein to such an extent that it cannot shift and that a firm exterior surface is obtained of the desired shape.

power of the wind for driving various devices, but is best adapted to marine propulsion. The novel features of the invention are to be found in a friction-gearing interposed between the wheel and the part to be driven. The windwheel turns a rotatable plate which is engaged there is a strong inclination after eating, by a friction-wheel. By sliding the friction-wheel toward and from the center, the speed of transmission is varied.

Portland, Ore. The feed-board or platen is provided ject ontwardly from the inner ends of the cylindrical with a gage for engaging one side of a sheet; and on the flanges. Hoops surround these cylindrical flanges and feed-board a pivoted angular jogger-arm is mounted opposite the gage and provided at one end with a jogger enables the parts to be separated with facility and nested for engaging the opposite side of the sheet to move that sheet against the gage. The jogger is automatically moved outward, and is moved inward by a spring. The sheets are held in proper position between the jogger and the gage, while moving off the feed-board; and in case of a ATTACHMENT FOR EMBROIDERING MAplaten-press the sheets are brought in proper position, so

Railway Contrivances.

DETECTOR-BAR. - WILLIAM H. HIGGINS, Jersey City, N. J. Detector-bars are employed to detect the presence of engines or cars upon a railway-track and to prevent the movement of a switch under the engine and cars. The present invention provides such a har of any desired length. The lower portion of the bar is furnished with any desired number of motion-plates, the lower surface of which has movement in guides or clins to impart the desired motion to the detector-bar; while the upper surface of the motion-plates serves as guides that surface which represents the design. According to hattan, New York city. The apparatus is to be used in for the bar, acting in conjunction with guide-surfaces the present invention, the design is cut into the metal or connection with the reproduction of horse and chariot carried by the clips in which the detector-bars have move-

PNEUMATIC SAFETY-GATE.-WILBUR F. HORN, Carlisle, Penn. The inventor has devised improvements in railroad safety-gates, whereby the gates are operated by the direct power of currents of air, gases, or vapors issuing from or entering the gates on opposite sides of their axes. These currents are produced by pressure appliances automatically actuated at a distance by the

Miscellaneous Inventions.

ADJUSTABLE SCREW-JACK.-JOHN C. F. LONG and James N. Bish, St. Mary's, Ohio. This adjustable screw-jack is especially intended for service in oil-wells in raising and lowering sucker-rods, polish-rods, valves, etc. It contains a hollow screw-rod, with a head having an offset thereon for keeping the screw-rod from turning. Also a set-screw in the head, a nut screwing on the screw-rod, a swivel mounted to turn on the nut and furn. ished with a head having a hore adjusted on a line with the bore in the head of the nut, and that in the screwrod. A set-screw is in the swivel-head, with means for holding the swivel against any displacement in the head

TOOTHPICK .- GEORGE W. SCHEILENBACH, Joplin, The toothpick has a hollow tubular body such as a quill. One end is closed and the other is formed with a point. Adjacent to this point and within the hollow body, there is a quantity of flavoring or medi-DRIVING APPARATUS.—Walter J. Le Barron, cinal substance, held in place by cotton wadding or Barre, Vt. The apparatus is designed to utilize the other packing. When using the pick these ingredients which may be gam-camphor, licorice-root, cinuamonbark, sirup, honey, or the like, are brought into use. The purpose of the device is to provide a substitute for cigarettes, chewing-tobacco, etc., for the use of which

TOY DRUM.—Morton E. Converse, Winchendon, Mass. The body of the drum has metallic heads with circular flanges extending toward each other and sur-GAGED FEEDING-JOGGER. — Ross H. PRATT, rounding the ends of the body. Annular flanges proenables the parts to be separated with facility and nested so as to take very little space in transportation, and to be readily put together and secured in their proper positions for use.

> NUT-LOCK .- HORATIO E. DOWNING and HARRY L. DORSETT, Seward, Oklahoma Territory, To hold a nut securely so as to prevent any turning after it is screwed up to the desired place, the inventors have provided the nut with a recess extending along the bore of the nut, the bottom of the recess inclining inwardly and downwardly. A tapered locking-slide having an inner sharp corner and fitted to be driven home in the recess, forces the corner inward into the threads of the bolt. A cover removably beld on the nut holds the locking-

> GARMENT-TRIMMING. - RICHARD G. MARSH, Manhattan, New York city. The fabric folds upon itself and forms a plait, the folded parts being stitched together by a wave-like line of stitching. The portion between the stitching and the folded edge on being removed forms a scalloped edge for the plait outlined by the stitching. This serves to hold the plait in position over the body portion of the fabric. There can be any

desired number of plaits in a piece of material; and any kind of ornamental stitching can be placed between the

HOLDER FOR PICTURES, STATIONERY, OR OTHER ARTICLES. - WILLIAM H. H. DICKINSON, Missoula, Mont. This holder is a combination of clamping-bars, and a screw having an orifice therein through which the clamping-bars are passed. A bodybar holds the screw in place, the screw being moved to engage the clamping-bars and hold them in con-tact with the body-bar. The intention of the device is to hold for use or display, pictures, books, stationery, crockery, and other articles. It is adjustable to objects of various sizes and can be readily handled and adapted to take any needed angle relatively to its support.

The inventor has devised a method for fixing a handle to a pick so as to keep the pick or point from working tively beyond the faces of the plate. The lower end loose. To help secure this object, the clamping parts part of the blade is adapted to enter the cue-stick to are made entirely of metal, thus obviating the tendency to looseness, a defect which prevails where wedges or blade is driven into the tip to secure it. other tightenings engage wooden surfaces. The clamping-devices consist of two members, one of which fits over the handle, the other of which receives the pick. Both members are formed with mating-slots through which a pin is passed and held in place by a wedge. The two members, when thus keyed and wedged together, firmly clamp the pick to the handle.

VALVE FOR PNEUMATIC TIRES OF BICYCLES. -Franz Richter, Cologne, Germany. The construction of the valve is simple. The essential part consists of an elastic flat tube carried in a suitable manner by the valve-box connected with the pneumatic tire, This tube has an elliptically-shaped hole narrower at the bottom than at the top and not lying in the middle of the tube, so that a narrower slit with two adjacent lips of vice versa. The buckles comprise separable body-memdifferent sizes is formed. The lower slit permits the air bers furnished with guides which receive the connectto enter; but when the pump is stopped, back-pressure of the air in the tire presses the smaller lip against the broader, so that no air can escape.

BROOM. - Homer W. Hodge, Atlanta, Ga. This broom is designed for use in cotton and woolen factories and around machinery. With this end in view, the broom is made with metallic shields arranged in a manner to strengthen the broom and protect it from damaging contact with machine-frames.

FOLDING BED.-LEWIS B. JEFFCOTT, Manhattan, New York city. The bed proper has a section pivoted to the bed-casing at one end. To this section an end flap ends at the lower edge of the waist-band, which section is hinged, extending into the casing. The latter leaves the flaps free of the corset. The flap can be resection has cam-faces, which are engaged by rollers in leased without disturbing the waist-band. The waistthe casing when the bed is folded. The weight of the bed holds the several sections in an innermost folded position, as the pivot is located at the lower, outermost corner of the bed. Hence no springs, weights, or other devices are necessary to hold the bed in a folded position within the casing.

COCK .- John Morrison, Dubuque, Iowa. The invention provides a mechanism for permitting the adjustment of the plugs of stop and waste cocks, so that the plug may be rendered right or left handed in operation, according to the desire of the user or to the position of the cock. The essence of the invention is to be found in a novel arrangement of cap and casing, whereby the plug is always prevented from describing an angle greater

WIRE-GRIP.-HARRY A. Mossman, Manderson, S. D. The device is to be used for gripping and stretching fence-wires. On opposite edges of the stock convergent cheek-plates are mounted. Against the cheekplates jaws are movable. Guide-plates and a stop-plate are also provided. The jaws are moved forward; and the inclined cheek-plates cause the jaws to be moved toward each other. Then by means of a suitable stretching device drawing longitudinally upon the gripper, the wire may be stretched. The greater the pull on the device, the greater will be the clamping effect of the jaws upon the wire.

ENVELOP .- HENRY TRENCHARD, JR., Manhattan, New York city. In "tension-envelops" of the type in which a cord is secured to the back of the envelop by means of a tubular rivet, dust and dirt sometimes enter and thus soil the contents of the envelop. Moreover the exposed inner end of the rivet is apt to scratch the contents. To obviate these difficulties, the inventor employs a cap-piece in connection with an inner washer to cover the inner end of the rivet.

ORNAMENTAL OBJECT. - EMILE BICK and CHARLES II. HAHN, 1417 State Street, New Haven, Conn. The principal object of the invention is to ornament articles in imitation of tree-bark, with knots projecting unduly strained. from the surface. This effect is secured by covering the object with papier-mâché while in a plastic state and embedding in the papier-mâché plugs of wood which project and are also covered with papier-mâché.

WITH GAS. -- EDWIN C. WORNS, Manhattan, New York city. There are one or more receivers for the water to be impregnated. The gas is taken from one or more "bottles" by pipes to the water-receivers, and the more "bottles" by pipes to the water-receivers, and the water is then charged with the gas. The aerated or impregnated waters are to be dispensed from the receivers by pipes. A chamber containing gravel is interposed between the dispensing pipes; and the water is caused to pass through this chamber, the gravel therein serving to break the water into separate globules or drops.

PIPE-COUPLING. - CARL EIBEE, Brooklyn, New York city. The mating sections in this apparatus can be quickly locked together and made water or fluid proof. step, with the two ends terminating at opposite sides of They can be readily separated under all weather conditions. These sections have a transverse tongue-and- PICTURE-FRAME.-WILLIAM H. Holtz, Brooklyn, grooved connection. The part provided with a tongue New York city. The design consists of a Viking ship, has an offset bottom surface adapted for use when the seated in the stern of which is a cupid holding a torchsections are to be uncoupled, the other has offset faces In the sail is an opening to receive the picture. Ornaadapted to be engaged by a clamping device and a latch between the two sections.

BADGE.-Benjamin Harris, Manhattan, New York | GAS BURNER.-Lewis S. Brown, Columbus, Ohio. the rod and the opposite end of the badge. There is a cleaned. connection between the rod and the pin. The end portions of a front plate are turned back behind the back plate and engaged with the ends of the front one, to the name of the patentee, title of the invention, and date

DEVICE FOR MOISTENING AND SEALING EN VELOPS.—CHARLES L. Vose, Westerly, Rhode Island. The device comprises essentially a combined water-reservoir and handle, the one end being provided with a sponge and the other with a roller. After the gummed surface has been moistened by the sponge, it is evenly and squarely sealed by means of the roller. The entire method is so simple and so cleanly that the device should do away with the old objectionable method of sealing

BILLIARD-CUE-TIP FASTENER.—WILIAM HESS, Manhattan, New York city. The invention provides a fastener for the tips of cues, which will be practically indestructible and will permit a new one to be applied whenever the old one becomes unfit for use. The fast-PICK.-WILLIAM PERRY BEVINGTON. Escondido, Cal. ener comprises a plate and a blade fixed rigidly in the center thereof, with its end portions extending respechold the plate in place. The upper end portion of the

> THILL-COUPLING. - RICHARD ECCLES, Auburn, N. Y. In this invention the shaft-shackle has the eve adjustable to any size of pivot so as to permit quick shifting and prevent the accidental dropping off of the eye from the pivot. The shaft-strap has an eye at one end, which eye has a hinged section. A bolt is hinged to the strap and extends through the hinged section of the eye. A nut on the bolt is adapted to be seated on the hinged eye section. One arm of the nut engages the eye portion of the hinged section, the other, the strap.

> COMBINATION PULLEY AND SASH BUCKLE. -Julius Brower, Manhattan, New York city. The object of this invention is readily to permit the change of the device from a pulley-buckle to a sash-buckle, or ing straps when the buckle is used as a pulley-buckle. Clasp devices unite the body-members when the buckle is used with a sash. The clasp and guide being movable, one can be adjusted out of the way of the other, and vice versa.

> APPAREL-DRAWERS. - JOSEPH R. WHITE, St. Josephs, Mo. This garment has a body and a waistband, the latter lying closely around the waist, with its upper portion beneath the corset. The body of the drawers is formed at each side with approximating vertical slits producing a rear flap. The upper edge of this band of the garment under the corset is thus capable of being worn without interfering with the unrestricted use of the drawers.

> TOY .- THALEON BLAKE. Philadelphia. Penn. The toy comprises a barrel which carries a picture. A wheel mounted therein has a non-continuous web which exposes the picture as the wheel turns. To provide for rapid revolutions, there are means for assisting the application of a blast of air to the wings carried by the wheel. The picture appears when the barrel is turned and is invisible when the barrel is at rest.

> PAPER BOX.-Joseph T. Craw, Jersey City, N. J. This device provides a slide-box for tacks or other small and so folds and connects certain members of the piece and spread, it can be quickly restored to its position within the tube.

> APPAREL-BELT.-AMAND WIGHARD, Jersey City, N. J. The belt contains two main sections, the rear one having loops at its end through which the sections slide. There are clips on the rear ends of the sections with an adapted mainly to waist-bands for women's wear. It yields lengthwise, thus securing a snug and easy fit.

> WINDMILL-WHEEL. - JOHN E. ALBERS, Wisner, Neb. The wings of this apparatus can be readily set at any angle, according to the force of the wind. For a strong wind, a weight is shifted in toward the fulcrum of a lever. For a light one, the operator moves the weight outward on the lever. This insures a uniform running in light or heavy winds, and without requiring the turning of the wheel out of the course in which the wind is blowing. By this arrangement the wind-wheel is never

HORSE-CHECK.-Robert T. Geer, 178 West 94th Street, Manhattan, New York city. This simple horse-check comprises practically two parts, a bracketstrap and a check-rein, so arranged that, a pull upon the APPARATUS FOR IMPREGNATING WATER check-rein will cause the bracket-strap to bring pressure upon the glands of the neck which lie just back of the iaw-bones and constitute the most sensitive part of a horse's neck. So efficient is the device that a horse the animal or harness. The device is now being manufactured.

Designs.

SHOE. - JAMES H. SPARKS, Chicago, Ill. The fastening line is extended in a compound curve across the in- AND EACH BEARING THAT DATE.

ments are used to heighten the artistic effect of the whole.

city. This article has the ribbon-supporting rod pivoted. The body of the burner is annular and is provided with at one end of the badge. A fastening-pin is parallel with a removable flanged centerpiece. The construction is the rod and pivoted to the badge between the pivot of such that the interior of the burner can be readily

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(7958) W. E. S. asks: 1. Which system of dwelling house heating is most desirable, reliable and healthful: steam, hot water or air? A. Each of the three systems named are desirable, reliable and healthful if properly installed on sanitary lines. All three systems are largely in use and each is selected to meet the tastes of house owners or first economy of erection. The hot water circulating system is probably the highest in first cost, cheap to operate, and a most convenient sys tem to regulate in moderate weather. Steam is best suited to a cold climate where an active element of heat is required. The hot air furnace is so much a universal heating agent that but little can be said against its usefulness and convenience in small and medium-sized houses. With any of these systems used in modern dwellings ample ventilation is had from open fireplaces and windows. Where there are no fireplaces ventilating registers near ceiling and floor with flues to the roof articles. It is constructed from a single piece of material, are in order. 2. How should ventilation be provided if water or steam is used? Would it be sufficient to put m that a tube and a sliding-tray are obtained. The tray is main hall on first floor of two-story house, for ventilacapable of entire withdrawal from the tube and then tion, seventy-five square feet of heating surface boxed spreads apart, so that the contents are made accessible to in and connected to fresh-air flue of one half square foot inspection. When the tray is withdrawn from the tube area? The house contains about 19,000 cubic feet of space and is occupied by six persons, use electric light and also a few kerosene lamps, say one for six hours in twenty-four. A. Artificial ventilation by a radiator in a flue closure is not needed, except in buildings of complex structure. 3. Where would be the best place for foul-air flue, and what size? If at bottom of room, how elastic attached to the clips and also to the rear section. A will current outside be kept from entering? A. Foul ribbon or tape is connected with the clips and to the rear | air flues, if properly provided above the roof, will seldom section, being between the elastic and this section. It is draw down when the house is heated. Summer drafts may be occasionally downward for the same cause as with cold chimneys. Heated rooms will always cause an up-draught in a ventilating flue, 4. Can you give rule for finding size of single and double belts for transmitting power and also size of shaft, where speed and power is known? A. The rules for belting are somewhat complicated by the angle of contact, tension, quality and kind of belting used. The rules for shafts and belts are fully set forth in tabulated form and conditions, in Kent's "Mechanical Engineer's Pocket Book," which we can furnish for \$5 by mail. A general rule for single leather belts is to allow 144 square feet of belt passing a given point per minute to equal one horse power. A double belt is about 40 per cent greater in power than a single belt of same width, but must have greater tension. The rules for shafting also vary very much with the kind of metal as iron, cold-rolled iron, steel and the conditions of use; which are fully set forth in formulas and tables in Kent's pocket book.

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