

sight-openings spaced apart from it, and disks arranged between the bearing-bars and the slate, and made to expose portions of their surfaces through the sight-openings in the slate, together with pulleys and gears for operating the disks—these comprise an apparatus for use in teaching and drilling in primary arithmetic, whereby problems in addition, multiplication, subtraction, and division can be quickly and accurately indicated.

**CUFF-HOLDER.**—LOGAN CUMMINS, Memphis, Tenn. The arrangement of this mechanism furnishes a convenient attachment to a coat-sleeve at any needed point of its length for bringing the cuff into the desired position relatively to the sleeve. The construction permits an easy attachment or detachment of the holder from the cuff. A spring-clasp engages the inner edge of the cuff, a spring attaching device having prongs to engage with a sleeve, and a link for connecting the spring attaching device with the clasp.

**TAILOR'S SQUARE.**—DOMENICO SEBASTIANO, Manhattan, New York city. This square has two blades. One is used for getting the position of lines extending across a pattern and which locates certain positions upon the garment, such as the bottom of the arm-opening and the waist-line. The other is laid out with groups of marks arranged in plural series, the groups of each locating points upon the cross lines on the other blade of the square. The marks of each group are so disposed with reference to the corner-angle of the square as to place corresponding patterns of different sizes.

**SUSPENSORY BANDAGE.**—ALFRED CHARLES MOSS, Streator, Ill. The harness supporting this bandage is suspended from the shoulders instead of from the customary waist-line. It can be worn without discomfort or irritation. Metal buckles or fastening devices are not required; so that the fastenings employed are flexible, readily adapting themselves to the body and permitting an effective adjustment to the person. There are two loops connected at the back by straps, one of the loops being provided at its lower end with an extending tape, and the other with a series of longitudinally-arranged loops with which the free end of the strap or tape can be interlaced.

**MANDOLIN-CITHERN.**—FREDERICK MENZEL-HAUSER, Jersey City, N. J. In this instrument the strings are sounded by means of picks, so that a tremolo or mandolin effect is produced. The picks are actuated by keys depressed by the fingers of one hand, while the other hand or a separate motor yields the power necessary to vibrate the entire pick-carrier, the speed of which will be such that the strings will be sounded two or three times before the key is released, so that a sustained tremolo impression is produced. By turning the handles at varying speeds, a changing degree of tremolo is obtained. The cithern has a keyboard extending across the strings.

**TOY MAN-OF-WAR.**—MORTON E. CONVERSE, Winchendon, Mass. The construction makes this toy virtually an ironclad, the hull and turrets or mountings for the primary battery being of metal. The sponsons, ports, and guns of the secondary battery are offset from the hull by embossing their parts, the guns of the primary battery being detachably mounted in the upper or deck structure. There is a wheeled support for the toy. The hull is hollow and open at the bottom, whereby all the parts can be stored away in the hull, together with the wheels. This enables the toy to be easily packed in a small compass and shipped without danger.

**LIQUID-AIR CONTAINER.**—JOHN SPRATT WRIGHT, Oil City, Penn. This device is for the economical utilization of liquid air in hospital wards, residences, auditoriums, etc. It consists of an open cup for liquid air, situated in the middle of the floor of a chamber or reservoir made of thin heat-conducting materials to contain the gases evaporating therefrom. The reservoir filled with these evaporated gases, with its frost-covered surface, will make an excellent cooler for the room. There are outlet-pipes controlled by cocks for the issue of the evaporated gases. By proper manipulation, some of the oxygenated liquid air in the cup is permitted to flow out on the floor and wall of the reservoir to evaporate, highly oxygenated air being thus obtained. The liquid air left in the cup is retained for later use as desired, evaporation therefrom being retarded by insulation by the cold air above it.

**CUT-OFF VALVE FOR HYDRAULIC ELEVATORS.**—PHILIP F. CANTLION, Manhattan, New York city. The inventor has devised a valve for automatically cutting off the water-supply to the pressure-cylinder, should the elevator move too far upward, and to retard an outflow of water should the elevator move too far downward, thus preventing accidents should the ordinary valve mechanism become inoperative.

**PIPE-FASTENING.**—JOHN M. SPEAR and WINNIE R. STRAW, Plainfield, Wis. By means of this device, the diameters of pipes, thimbles, or elbows can be adjusted so that they can be readily made to fit the parts with which they are to be used. The pipe is split longitudinally and has a part of one edge formed with a lap turned outward and laterally extending a part of the length of the pipe. The pipe has at its other longitudinal edge a lap extended inwardly and laterally throughout the length of the pipe. The laps are inter-engaged. The pipe has its side edges fastened rigidly together throughout the length of the first named lap, leaving the edges at one end free. The two parts of the pipe can be relatively moved to adjust the diameter.

#### Designs.

**BELT.**—LOUIS SANDERS, Brooklyn, New York city. The leading feature of this design is found in a peaked frontpiece, connecting the ends of a back section. A ring or chain ornamentation is provided for the front-piece.

**GARMENT-REGULATING ATTACHMENT FOR BELTS.**—LOUIS SANDERS, Brooklyn, New York city. The attachment consists of a small plate, the formation of whose body includes a lower transverse section and upright sections connecting with the end portions of the transverse section. A corresponding flange is formed at the bottom of the transverse section. The attachment is easily adjusted and performs its functions efficiently.

**NOTE.**—Copies of any of these patents can be furnished by Munn & Co. for ten cents each. Please state the name of the patentee, title of the invention, and date of this paper.

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(7905) B. G. J. writes: 1. In a spark coil for a current of 98 volts and 50 amperes, what would be the size of the insulated wire, of the short wires forming the core? A. You may make your spark coil with a core of No. 14 iron wires cut 12 inches long, and annealed by heating red hot. The core should be about one inch diameter. Upon this wind the coil, insulating each layer with brown paper. Use No. 12 copper magnet wire, double covered with cotton. Six layers should give a good spark; more can be put on, if necessary. 2. What is the formula for birdlime? A. For birdlime boil the middle bark of the holly, gathered in June or July, for 6 or 8 hours in water, until it becomes tender; then drain off the water, and place it in a pit under ground, in layers with fern, and surround it with stones. Leave it to ferment for two or three weeks, until it forms a sort of muckage, which must be pounded in a mortar, into a mass, and well rubbed between the hands in running water until all the refuse is worked out; then place it in an earthen vessel, and leave it for four or five days to ferment and purify itself. Remarks: Birdlime may also be made from mistletoe berries, the bark of the way-faring tree and other vegetables, by a similar process. Should any of it stick to the hands, it may be removed by means of a little oil of lemon bottoms or turpentine. Use: To rub over twigs to catch birds or small animals. It is said to be discutient when applied externally. 3. Has any number or numbers of the SCIENTIFIC AMERICAN directions for making spark coils, motors or dynamos? If so, what number? A. We have published the plans and descriptions of many dynamos and motors. See SUPPLEMENT, Nos. 161, 600, 641, 750, 761, 783, 844, 865, 720, 793, 1202, 1210. And for coils, see SUPPLEMENT, Nos. 160, 569, 1087, 1124. Any or all of these can be sent you for ten cents each by mail.

(7906) T. L. C. writes: Suppose a cannon was placed perfectly level. When fired, would the ball rise when it left the muzzle or would it commence to drop the instant it left the gun? A. Gravity acts constantly, and the ball commences its downward curve at the instant it leaves the gun.

(7907) O. S. writes: I intend to erect lightning conductors at my buildings; they will be made of two-inch tubing below, reduced to one inch at the top, connected by a heavy copper wire running from the top, of one conductor to the other above the building. A. With reference to lightning rods we advise you to buy our SUPPLEMENT, No. 998, price 10 cents, which will give you much information upon the matter. 1. How high above the building should the conductor and wire be and how far away from the buildings should the conductors stand? A. The conductor should be carried to all high points of the building, and not merely to its highest point. It is not wise to erect very tall pointed rods projecting several feet above the roof. The conductor should be next the building and not stand away from it, and all metallic masses, such as water spouts, should be connected to it; though all authorities are not agreed in regard to this point, the latest opinion is in this direction. 2. Would lead joints do to connect the tubing with, or should the joints be iron? A. Connections may be soldered, riveted or screwed. In whatever way the parts are joined, the joint must be firm. 3. Would four feet in the ground with a lot of old iron at the bottom of the conductors be all right? A. If the ground is permanently wet, yes. The moisture of the earth is the important element, and not the depth. The rod must extend to water, no matter how far that is. 4. Will wood do to hold the wire and conductors to the building, or should I use glass? A. Opinions vary upon this point. We are inclined to think a wooden fastening is as good as any. 5. Will it do to put the ends of the wire inside the tubing at the top and drive a plug in tight?

Would this make a good connection? A. No. What has been said above regarding connections, answers this question. Nor should you change to a copper wire. Copper is not considered to have any advantage over iron. A galvanized iron telegraph wire is sufficient if carried liberally over the roof and all high parts of the building. Nor is a two-inch pipe desirable. A one-inch pipe is entirely sufficient. Size is not important. Lightning often leaves a heavy rod and takes to a fine wire on its way to the earth.

### NEW BOOKS, ETC.

**DIGEST OF UNITED STATES AUTOMOBILE PATENTS FROM 1789 TO JULY 1, 1899.** Including All Patents Officially Classified as Traction Engines for the Same Period. Compiled by J. T. Allen, Examiner United States Patent Office. Washington, D. C.: H. B. Russell. 1900. Quarto. Pp. 700. Sheep. Price \$25.

The compiler has performed a difficult task with great credit to himself. He has previously compiled a digest of patents for cycles and velocipedes which has been of the utmost possible use, also of seeding machines and implements, plows and attachments, cultivators and wheel plows. All the patents relating to horseless vehicles are included in the portly volume. The patent drawings are reproduced photographically and no drawing is omitted, every sheet being given, which is most important to those who are engaged in inventing along the line of automobile vehicles. The remaining portion is a reproduction of essential descriptions of the inventions, with claims in full, with full data as to the patent, and further there is furnished a complete index to the references cited against the patents while pending as applications by number, name and date, and also the interferences, if any, the parties thereto and the decisions. The index is alphabetical. The patents are arranged chronologically under the heads of spring, steam, gas, air, electricity and gearing, while under the head of traction engines are given all traction engine patents as officially passed upon. There are various indices adding to the value of the book. The automobile patents are continued from July 1, 1899, in the United States Electrical Weekly, which is also compiled by Mr. Allen.

**THE GENESIS OF WORLDS.** By J. H. Hobart Bennett. Springfield, Ill. 1900. 12mo. Pp. 345. Price \$1.65.

**SYSTEM OF MEASUREMENTS ADOPTED BY THE NATIONAL ASSOCIATION OF MASTER HOUSE PAINTERS AND DECORATORS OF THE UNITED STATES.** New York: The Painter's Magazine. 1899. Quarto. Pp. 60. Price \$1.

This book contains a great deal of useful information for the architect as well as for the painter and decorator, giving the result of the labors of the committee appointed by the National Association to formulate a system of measurements of painter's work, which should be thoroughly accurate in every particular. There are six lithographic plates, measuring 16×10 inches, showing the application of the system to houses of various designs and different interior and exterior details. It is only necessary to measure the work in accordance to the rules laid down, and apply the local price per square yard of plain surface, which is governed by cost of material and labor, to be able to correctly estimate the most complicated job of painting.

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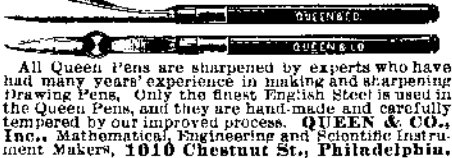
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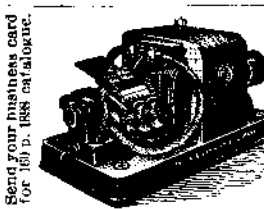


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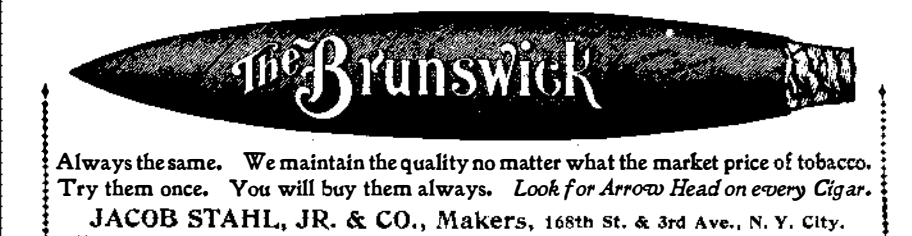
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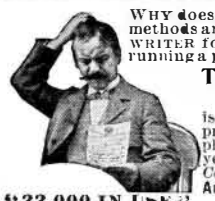
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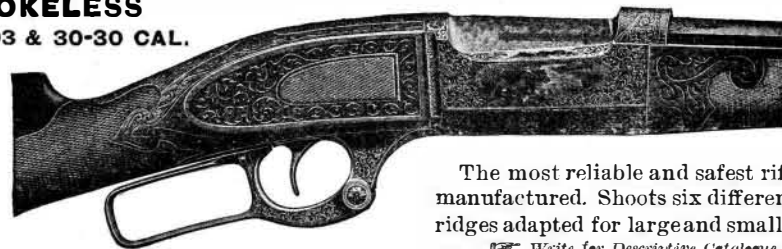
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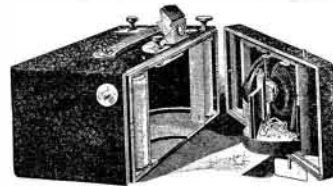
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