machine has attained full speed, and then the clutch takes hold of the loaded pulley.

MULTICOLOR PRINTING PRESS.—F. E. KEMPF, care of Joseph Baron, 333 West 16th Street, New York, N. Y. The object of Mr. Kempf's invention is to provide an improved multicolor-printing press designed to permit printing in any desired number of colors on one or both sides of the sheet and arranged to allow quick adjustment of the several parts to enable the operator to conveniently and easily "make ready" and insure perfect impressions. The machine is also applicable to the printing of wall papers, textile and oil cloths.

MUSIC-LEAF TURNER.—J. W. O'NEEL and J. R. EDWARDS, Lafayette, Ore. The turner is of that class in which a number of wings intended to be attached, respectively, to the music-leaves are arranged to be turned in succession by operating devices actuated either from the operator's hands or feet. The principal novelty lies in the manner of mounting and successively operating the wings and in the devices for returning any one or all of the wings either to repeat a part or the whole of the music or to place the apparatus in position for renewed operation of any sort.

METALLIC PACKING.—J. JACOBSON, Lead, S. D. This invention relates to packing for rods that are members of steam and other engines, and has for its object to provide features of construction for metallic packing, which adapt it for very effective service, enable the convenient inspection or renewal of interior details when worn so as to require it, and that permit the application of lubricant through the packing and upon the rod packed therewith.

CAKE-MIXING MACHINE.—JULIA C. GAUTIER, Columbus, Ga. The object of this invention is to produce a machine in which batters for making cakes, etc., can be quickly and easily formed and in which the whites and yolks of eggs and butter which are used in making these batters can be separately beaten at one and the same time by one person.

PNEUMATIC LEAF-TURNER.—J. W. ALBIN, Babylon, and L. A. SEAMAN, Mineola, N. Y. In this patent the invention of Messrs. Albin and Seaman relates to leaf-turners, and more particularly to the kind used in connection with sheet-music, their more particular object being the production of means for operating the same pneumatically by the pressure of the operator's foot.

HAT-MACHINE.—G. W. CHAMBERLAIN, Atlanta, Ga. The invention relates to improvements in machines for forming bell-crowned hats of felt or similar material, an object being to provide a machine by means of which bell-crowns may be quickly and uniformly pressed into shape without danger of tearing the hat material.

CARTRIDGE-LOADER.—E. E. BRECKENRIDGE, Manning, Iowa. The invention comprises a comparted hopper with measuring devices for withdrawing the charge of powder and shot therefrom and discharging the same into the cartridge-holder, which is sectional to engage and release the cartridge and which is so positioned that the rammer, which is located above the holder, may be moved down into the same to ram the charge and wads in place.

SPLIT PULLEY.—G. F. MCLYNN, Cottagegrove, Ore. In the use of this efficient device the sections are placed about the shaft in the usual manner, with a bushing of proper size interposed, and then clamped upon it by bolts, a sectional bushing used if desired to secure engagement. When fixed in place, it will be seen that the strain upon all parts of the rim is communicated directly to the shaft and at places where the structure is weakest, this being at the juncture of the sections, a double support is given.

STIRRING APPARATUS.—J. S. DEAL, Monroe, Wis. In the present case the invention relates to apparatus used in the manufacture of cheese; and its object is to provide an apparatus more especially designed for stirring milk in the cheese-kettle and arranged to allow of moving the kettle over or off the fire without interruption of the stirring process.

TRANSMISSION-GEAR.—C. H. DAY, Hornellsville, N. Y. The mechanism consists of a gearing of the sun-and-planet type, whose principal feature lies in the arrangement by which the planetary gears are carried bodily by the driving member and moved continuously around the axis thereof, high speed being attained by locking the gearing and low speed and reverse being attained by coacting gears of varying ratio.

PUMP-COUPLING.—C. W. DECKER, Charles City, Iowa. The object in this improvement is to provide a construction for coupling the pump-handle to the pump-rod and at the same time uncoupling the windmill-rod from the pump-rod, and *vice versa*, by the movement of pump handle or lever and to so construct the parts that they may be easily and quickly attached to any ordinary windmill-pump by means of a wrench and file.

Prime Movers and Their Accessories.

WINDMILL-LUBRICATOR.—H. H. TATSCH, Fredericksburg, Texas. An object of this invention is the provision of a lubricator adapted at predetermined times to supply a lubricant to a receptacle, from which receptacle ducts lead off the lubricant to the portions of the windmill to be subjected to lubricating process. Lubricating operation will not take place until certain mechanism actuated from the mill-pitman is brought into operation to supply the receptacle, referred to, with the lubricant. There is no possibility of dust, snow, ice, or the like clogging or interfering with the operation of the parts.

ENGINE.—O. P. UNDERWOOD, Central City, Neb. The invention relates to multicylinder-engines. The object is to provide an improved engine which is simple and durable in construction, very effective in operation, and arranged to utilize the motive agent to the fullest advantage to insure a uniform and constant transmission of the power developed to the main shaft at all points of the latter's rotation and completely avoid dead-center positions.

WINDMILL.—T. O. PERRY, Chicago, Ill. Of objects in this case, one provides for automatically changing the weather angles of sails from positions suited to easily starting motion to other angles better suited to efficiency after the wheel gains motion and, vice versa, to provide for having sails automatically assume better weather angles for starting motion whenever the motion of the wheel ceases or is unduly retarded; another, provides further automatic regulation of weather angles of sails for preventing excess motion in high velocity winds, or for maintaining motion not to exceed desired maximum in any wind.

Pertaining to Vehicles.

ADVERTISING-VEHICLE.—J. A. ELDRED, New York, N. Y. The object of this invention is to provide an improved advertising vehicle having fixed and movable advertisements to readily attract the attention of the public while the vehicle passes along the highways. The body of the vehicle comprises a number of advertising panels between which mirrors are placed. Two large spheres are placed in the upper part of the vehicle which carry advertisements and are slowly rotated as the vehicle moves along.

VEHICLE.—J. A. WILLIAMS, Cleveland, Ohio. In this patent the invention relates to vehicles, and more particularly to the axle of those of the motor-driven type. Its principal objects are to provide a simple and durable arrangement whereby the driving power may be applied to the axle of the steering-wheels. Mr. Williams has made another invention relating to vehicles, it being particularly applicable to those propelled by motors. It has for its principal objects the provision of means for connecting to the same supporting-wheels both the vehicle steering and driving mechanism.

RATCHET-LEVER.—H. W. KOEHLER, Oswego, Ore. In this case the invention has reference to novel features of construction and arrangement residing in a ratchet-lever and ratchet, by means of which a suitable leverage may be exerted on the ratchet, and the dog or pawl must automatically disengage the ratchet upon the reverse movement of the lever.

DOUBLE-TUBE TIRE.—F. F. THOMPSON, Lawton, Oklahoma. The design of this invention is to overcome many difficulties in a simple and practical way. To that end it consists in locating the valve-hole of the outer tire at a distance beyond the slit, so that said hole is not bisected on one side of the slit; but the hole has a solid collar of the outer tube material all around the valve hole, forming an unbroken reinforce for the valve-nipple, so that there is no bulging of the inner tube on one side of valve immediately adjacent thereto and difficulties are entirely obviated.

Railways and Their Accessories.

SLEET-CUTTER AND CONTACT FOR ELECTRIC RAILWAYS.—C. T. LEONARD, Leonardo, N. J. The invention relates to improvements in a conductor-contact and sleet-cutter for electric railways, the same being more especially adapted for use in connection with the third rail of an electric railway system, although some features may be used on overhead electric conductors and in other railways. It provides a contrivance for insuring good electrical contact with a conductor-rail and for rapidly and thoroughly cutting sleet adhering to the head of such rail. It provides means for clearing away ice and sleet, so that good electrical contact may be secured between rail and contact and cutter wheel, and furthermore, to yieldably hold parts under pressure in working positions.

CAR-FENDER.—W. T. WATSON, Newark, N. J. The invention has reference to an improved fender, which is arranged automatically to assume a basket-like form upon a person falling into the fender, so that in this manner the fallen person will be held safely until the car is stopped and the person removed from the fender.

Designs.

DESIGN FOR A CUP.—J. A. MOLLER, JR., New York, N. Y. In this ornamental design the invention presents a ball-shaped cup, near the top of which is a round rim opening. Two gracefully-poised cattle horns connect with the sides of the cup at its center with the bottom of the base holding up the bowl portion of the cup.

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

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For logging engines. J. S. Mundy, Newark, N. J.

Inquiry No. 6164.—For a salmon-colored newspaper 11½ x 44 inches, with or without lace ends, for lining orange crates.

"U. S." Metal Polish. Indianapolis. Samples free.

Inquiry No. 6165.—For embossed paper or metal cards for advertising fruit.

Perforated Metals, Harrington & King Perforating Co., Chicago.

Inquiry No. 6166.—For pressed paper imitating tiling and pressed steel ceiling for use over plain wood ceiling.

If it is a paper tube we can supply it. Textile Tube Company, Fall River, Mass.

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Adding, multiplying and dividing machine, all in one. Felt & Tarrant Mfg. Co., Chicago.

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Sawmill machinery and outfits manufactured by the Lane Mfg. Co., Box 13, Montpelier, Vt.

Inquiry No. 6169.—For manufacturers of sheet and wrought bar brass.

All Manufacturers.—See advertisement in last week's paper, page 324, of improved bicycle. Easiest of terms. A. A. Kennedy, Overbrook, Pa.

Inquiry No. 6170.—For manufacturers of tarred wooden tube wrapped with wire or iron.

DRY BATTERIES.—How to make and use them. Practical, with original drawings. Mailed for 25 cents. Spon & Chamberlain, 123 S Liberty Street, New York.

Inquiry No. 6171.—For a tool grinding outfit attached to a bicycle, so arranged that the bicycle paddles may be used in propelling.

Patented inventions of brass, bronze, composition or aluminum construction placed on market. Write to American Brass Foundry Co., Hyde Park, Mass.

Inquiry No. 6172.—For makers of light, portable emery grinding machines.

Sheet metal, any kind, cut, formed any shape. Die making, wire forming, embossing, lettering, stamping, punching. Metal Stamping Co., Niagara Falls, N. Y.

Inquiry No. 6173.—For manufacturers of ball and socket fasteners.

The celebrated "Hornsby-Akroyd" Patent Safety Oil Engine is built by the De La Vergne Machine Company, Foot of East 138th Street, New York.

Inquiry No. 6174.—For makers of square and flat wire in sizes up to ¼ inch.

We manufacture gasoline motor and high-grade machinery, castings best quality gray iron. Select patterns, and let us quote prices. Frontier Iron Works, Buffalo, N. Y.

Inquiry No. 6175.—For makers of wire paper clips.

Manufacturers of patent articles, dies, metal stamping, screw machine work, hardware specialties, machinery and tools. Quadriga Manufacturing Company, 18 South Canal Street, Chicago.

Inquiry No. 6176.—For makers of motor cycle engine castings and accessories.

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Inquiry No. 6177.—For machines for beveling the edges of cardboards.

Special Machinery to order, manufacturing, metal stampings, etc., Brickner Machine Co., Tiffin, Ohio.

Inquiry No. 6178.—For manufacturers of ink for inking typewriter ribbons.

WANTED.—Gasoline engine to build on royalty arrangement, or would buy. Chicago machinery manufacturing house. Engine must be practical, powerful, and adaptable mainly to small runabout automobiles. Address Machinery, Box 773, New York.

Inquiry No. 6179.—For the present manufacturers of the Merrill pump, lately of 120 Broadway, New York city, or repair parts for these pumps.

Inquiry No. 6180.—Wanted, to purchase outright a patent, or the manufacturing right of some small, light, mailable article, of general utility and attractiveness.

Inquiry No. 6181.—For makers of a machine for manufacturing wheat starch.

Inquiry No. 6182.—For builders of two-story rustic cottages with the bark on.

Inquiry No. 6183.—For makers of tin strips 2 inches wide, any length.

Inquiry No. 6184.—For parties to manufacture spatulas on paid contract.

Inquiry No. 6185.—For dealers in small hand power ice machines.

Inquiry No. 6186.—For parties to make patented cuff holders on contract.

Inquiry No. 6187.—For manufacturers who make igniter or electrode points in special shapes.

Inquiry No. 6188.—For manufacturers of a furnace regulator—automatic device to regulate draft and check damper.

Inquiry No. 6189.—For a small toy caloric engine.

Inquiry No. 6190.—For an automatic dice box with glass top, working by lever.

Inquiry No. 6191.—For a small kiln, new construction, where lime does not come in contact with fuel.

Inquiry No. 6192.—For makers of castings of auto engines, ¾ h. p., and dynamos about 8 lights.

Inquiry No. 6193.—For makers of wooden staves for straight-sided tubs, fiber board.

Inquiry No. 6194.—For makers of rotary ticket-cutting machines, pasteboard-making machinery, machines for coloring tickets, also for printing them, etc., of simplest construction.

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

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Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(9476) C. T. J. asks: 1. I have a book which tells how to construct induction coils, but the different sizes of wire to be used are all given in the English standard wire gage. Is there any way in which I could find out the corresponding number (size) of wire in the American, or B. & S. wire gage? For instance, number 30 English standard wire gage would be what number (or size) in the B. & S. (American) wire gage? A. Any book of tables for mechanics should contain the sizes of wires given both in the American and the British systems. Most school text books of physics contain them, also many catalogues of dealers in electrical supplies. These last can be had free by inclosing a stamp to these houses. No. 30 wire British gage is .012 inch in diameter. It is between No. 28 and 29 American gage, nearer No. 28. For the small wires, no great error will be made by using a wire one or two numbers lower in American gage. That is, the British wire is thicker than the American wire of the same number. 2. I have one of those small vest-pocket electric flashlights, the dry cell of which is nearly run down. Please state the voltage and amperage of the current most suitable for recharging the cell, if that can be done. A. A small dry cell should be recharged with about 2 volts and 3 or 4 amperes. It is very much cheaper to throw the run-down cell away and buy new, for a recharged cell is worth no more than half as much as a new one. 3. In the above question, how can a person tell when the cell is fully recharged, and about what length of time is necessary to carry on the recharging process? A. A dry cell should be charged till the voltmeter indicates 1.5 volts at its terminals. We cannot say how long it will require. 4. I have a small Ajax (toy) motor that will run on one cell dry battery. How many ohms resistance would it be necessary to connect in series with it so as to run it on a 110-volt direct current circuit? A. The amount of resistance required for a toy motor on a 110-volt direct current circuit cannot be told without knowing the resistance of the motor. As this is doubtless low, it will be safe to use 250 to 300 ohms. 5. How many 16 candle power, 110-volt incandescent lamps would it require to be connected in series with the above motor to obtain the required resistance? A. Try the motor in series with two 16 candle power 110-volt incandescent lamps, and if it does not come up to speed take out one of them. If it runs too fast add lamps. 6. Is there any better way of getting the above resistance so that the motor will run on the 110-volt circuit safely? A. There is no simpler resistance than that of a lamp bank, nor any more commonly used for experimental purposes. A water rheostat will answer equally well. 7. Would a 110-volt alternating current require any more or less resistance for the motor than the direct current circuit, and if so, how much? Would it run the motor all right, or just as well as the direct current? I mean the alternating current with the necessary resistance. A. An alternating current generally requires less resistance, if the coils are wound in spools, or inductively, than is required by the direct current. How much less cannot be told without full data. A direct-current motor may be run on a single-phase alternating current, but it is not self-starting. The motor must first be brought up to full speed and the current then turned on. 8. Kindly state the safe (allowable) carrying capacity, in amperes, of numbers 14, 12, 10 and 8 rubber-covered wire, respectively, on 110-volt circuits. A. The carrying capacity of rubber-covered wires by the tables of the underwriters is as follows, all systems and voltages: No. 1, 14 amperes; No. 12, 17; No. 10, 24; No. 8, 33.

(9477) J. A. C. asks: The question is often asked: How much voltage does a current of electricity have to have to kill the average man? I was of the impression that it depended on a good many other things as well as voltage, and that sometimes an extremely high voltage was harmless, as the current from a Wimshurst machine or induction coil. My friends tell me, though, that anything over two or three thousand is certain death. Have you any data as to the resistance of the human body? A. The amperes of electric current which can flow through the human body depends