RECENTLY PATENTED INVENTIONS.

The Inventions described in this Department were Patented through the Scientific American Patent Agency.

Pertaining to Apparel.

STOCKING SUPPORTER. — T. PAPWORTH, Portland, Oregon. This supporter is provided with a pair of jaws which may be attached to the underwear and a link locking device which may be attached to the sock or stocking. The device may be applied wherever convenient to hold the hose taut on the limbs of the wearer.

Electrical Devices.

ELECTROLYTE.—A. VAN WINKLE, Newark, N. J. The invention provides a new electrolyte for use in the electro deposition of zinc on iron and steel. The special object of the invention is to provide increased conductivity of the solution and to improve the color of the deposit as well as to insure a perfect plating, especially on concave surfaces.

Of Interest to Farmers.

MARKER ATTACHMENT.—L. R. TURNER, Long Pine, Neb. An efficient marker attachment for corn planters, and the like, is provided by this invention. The marker indicates the positions to be occupied by rows of plants or hills, and can be automatically disposed in a number of positions.

Of General Interest.

COMPOSITION FOR SOLIDIFYING FLUE DUST.—S. W. RAMSEY and G. W. SMITH, Youngstown, Ohio. In the operation of blast furnaces for the reduction of iron there accumulates a considerable quantity of dust which consists of small particles of oxid of iron, coke, and other constituents of the furnace charge. The present invention has for its object to convert this dust into bricks so that the iron it contains may be reduced.

BUILDING BLOCK.—A. G. MAHLER, Medford, N. Y. This building block is adapted to be quickly laid in constructing walls and is provided with improved means for connecting or bonding the adjacent blocks. The block is also designed to facilitate the application of plaster on the inner side of the wall, and affords a free circulation of air from the interior of the walls to the outside without allowing the admission of rain.

EMBROIDERY FRAME.—G. B. LYON, Ithaca, N. Y. This is an improvement on hand embroidery frames that are composed of a hoop and a clamping device for holding the fabric stretched thereon. In the present invention the hoop is constructed with flanges at each edge between which the clamp is applied. The latter is made of a transversely corrugated strip of elastic metal.

DEVICE FOR AUTOMATIC FIRING OR SELF-LOADING ARMS.—S. H. BANG, 24 Pehlenschlaegersgade, Copenhagen, Denmark. The invention refers to a trigger mechanism in connection with self-loading fire arms by means of which the gun may be made to act either to fire a single shot each time the trigger is pulled, or to fire automatically as long as the trigger is acted upon.

GATE VALVE.—G. H. BENTON, Metuchen, N. J. The construction of this gate valve is very simple and its operation effective. It is arranged to compensate for any inequalities in the seats and the gate faces, to insure at all times a firm and active seating of the valve gates to prevent leakage, and to allow convenient opening and closing of the gate valve.

WIND ACTUATED ADVERTISING DEVICE.—R. RAY, Carrollton, Mo. This advertising device is adapted for outdoor display of moving signs. It consists of a windmill, provided with the customary vane for directing the wheel into the wind and the vane is arranged to receive advertising signs.

Hardware.

SASH FASTENER.—H. ATWATER, Chattanooga, Tenn. The fastener provided by this invention is adapted to be mounted upon the meeting rail of the lower sash and lock both sashes in closed condition. The fastener is strong and conveniently operated and may be adjusted for locking either sash opened more or less, as may be desired.

Heating and Lighting.

BURNER.—W. H. DAMON, New York, N. Y. An improvement in hydrocarbon burners for heating rivets is provided by this invention. The burner is formed with air and fuel passages, a combustion flue surrounding the burner proper having air intake openings in the side and bottom, and a regulating device closely fitting the flue and having like openings in the side and bottom, the openings of the flue and of the regulating device being movable alternately into and out of register.

Household Utilities.

FURNITURE.—F. N. CHURCHILL, Spokane, Wash. The invention relates to a table of simple construction which can be neatly folded. When collapsed it can be shipped or stored without danger of injury to the parts, and at the same time requires a minimum of space.

SAD-IRON HEATER.—G. W. FALLIN, Montgomery, Ala. The body of this sad iron is hollow and carries an alcohol generator, and an alcohol burner. An alcohol generator is first heated to produce alcohol vapor and this is then burned to heat the sad iron. The upper face of the sad iron is thus heated from the inner side, and when it has attained the proper degree of temperature the body of the iron is inverted. While this side is being used the other surface of the iron is heated by the burner so that it will be ready for use when the side in use becomes cool.

Machines and Mechanical Devices.

WELL-DRILLING APPARATUS.—R. D. MOON, San Angelo, Texas. An improved mechanism for lifting the drill and permitting a quick and unimpeded drop of the drill bar is provided by this invention. The use of a high or top-heavy rigging is thus avoided, as well as the great jar and noise found in the use of ordinary rigs.

REVERSING MECHANISM.—T. H. and J. E. HOLGAN, New York, N. Y. The construction is applicable to shafts carrying drill chucks and the mechanism is such that as a drill or tap is brought into engagement with the work the drill shaft will be engaged automatically with the driving pulley in a manner to feed the drill or tap into the material, and as the work is withdrawn, the shaft will be brought into such relation with the driving pulley as to reverse the direction of rotation and withdraw the drill or tap from the work.

STONE SAWING MACHINE.—A. JONES, Oolitic, Ind. The invention relates to stone-sawing machines using rotating drums and endless traveling wires passing over the drums and serving to cut stone. The object of this invention is to permit of adjusting the wires conveniently and quickly in the desired position relative to the stone for cutting the latter into pieces of the desired width.

CONTINUOUS-DRAW VACUUM WINDOW-GLASS MACHINE.—D. H. HERSHEY, Latrobe, Pa. The invention provides a method for drawing glass in a cylindrical form suitable for flattening out to make window glass, also to a method of shaping the glass by producing a partial vacuum around the cylinder of glass as the latter is formed. Means are provided for maintaining a uniform diameter of the cylinder as it is drawn upward from the molten glass.

AUTOMATIC TRIP FOR CONVEYERS.—C. FREDERICKSON, Cameron, Wis. This automatic trip is arranged to operate at any predetermined place so that the material in the hopper may be deposited wherever desired. Should a wagon be under the cable of the conveyor the material may be evenly distributed therein without the necessity of moving the wagon.

MECHANICAL MOVEMENT. — S. JONES, East Liverpool, Ohio. A means for converting continuous rotary motion in one direction into alternate forward and backward rotary motion is provided by this invention. The new movement is adapted for use on washing machines, churns, and the like. It is arranged to automatically revolve a part of the machine, a predetermined number of times alternately, in opposite directions.

GRINDING MILL.—D. S. ANTHONY, Durango, Mexico. The object of this invention is to provide an improved mill more especially designed for grinding middlings and arranged to insure ready grinding of the corn, or other material, to any desired degree of fineness, and to allow easy sharpening of the grinding members.

MACHINE FOR FINISHING THE PACKING OF BARRELS.—L. STORCK, J. H. VOGT, and L. STORCK, Stamford, Conn. An improvement in machines for finishing the packing of barrels with pulverized or granulated material is provided by this invention. The machine is especially constructed to perform this operation on shipping cases which have been packed by a machine previously invented and patented by Messrs. Vogt and Storck.

SOUND BOX.—J. C. KERR, Valparaiso, Chile. The invention provides a sound box for talking machines in which practically the entire quantity of sound waves produced is forced to pass through the sound tube, and in which inharmonious or disturbing vibrations are avoided and all deadening of the sound waves is prevented.

PIANOFORTE.—W. R. T. HILL, Asheville, N. C. The invention provides an improved frame for pianofortes in which the tension on opposite sides of the frame is balanced so that the bending strain of the frame is eliminated, and the sound boards are made without ribs, the strings resting on the bridge at each end.

Prime Movers and Their Accessories.

FEED WATER HEATER.—J. H. KIDWELL, Staunton, Va. This feed water heater is designed for use on locomotives and is characterized by the fact that it utilizes the exhaust steam from the cylinders for the purpose of heating the feed water as well as using the hot gases in the smokebox at the front of the boiler for the same purpose.

STEAM TRAP.—A. L. RIGGS, Ebensburg, Pa. This improved steam trap is arranged to insure a positive and easy working of the valve controlling the inflow and the discharge of the water and means are provided for holding the valve locked in one position until the trap is accurately filled with a predetermined quantity of water. The valve is then held in its other position until this quantity of water has been discharged.

Railways and Their Accessories.

GRAIN CAR.—J. T. MCNALLY, Chicago, Ill. The car is designed to discharge the grain through a double bottom, provided with openings, the openings of one bottom being movable into and out of register with those of the other bottom. A door is adapted to cover these perforated bottoms when the car is to be used as an ordinary box car and this door is also adapted to cover one of the door openings in the side of the car when the car is to be used in hauling grain.

Pertaining to Vehicles.

TRANSMISSION MECHANISM FOR MOTOR VEHICLES.—C. M. LEECH, Lima, Ohio. The construction of this mechanism is such that its operation will have no tendency to throw the driving shaft out of alinement and the movement of the vehicle both forward and rearward can readily be controlled and gradually varied, the transmission passing from a friction to a positive drive on shifting the gearing from slow to full speed.

SPRING SUPPORT.—T. J. FAY, New York, N. Y., and J. M. ELSWORTH, Bernardsville, N. J. The invention relates more particularly to specific means for securing the spring supports of motor vehicles to the body or chassis. An improved clip is provided in which the securing bolts are formed integral with the main body of the clip so that the breaking of a bolt will not loosen the spring and the spring will be firmly held at all times unless all of the bolts should become broken.

DRAY WAGON.—G. R. MCLERAN, North Yakima, Wash. This invention provides an improvement in dray wagons, such as are used for hauling heavy loads of all kinds. The axle of the wagon may be lowered by locking the wheels to the axle and the wagon when then moved forwardly operates to adjust the main frame over the axle. In this manner the load may be lifted and secured to the wagon.

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 this paper.

Full hints to correspondents were printed at the head of this column in the issue of August 8th, or will be sent by mail on request.

(10956) A. H. N. says: If soft coal ashes be mixed with water to the consistency of mortar and then put in a round oak or other soft coal heater on a good bed of coals and the drafts opened, this mixture will burn freely. How do you explain this anomaly? A. There is always a considerable percentage of unconsumed fuel or combustible in ashes—especially soft coal ashes—even though they may appear to be free from coal; so that they will have a certain amount of fuel wherever they can be burned without clogging up a fire and choking the draft. The addition of a moderate quantity of water to a hot soft coal fire has a curious effect. If the temperature is sufficiently high, the water is decomposed, forming free oxygen and hydrogen, which later reunite at a point usually some distance above the body of the fire in a hot flame. No heat is actually added to the fire, the effect being to abstract the heat from the coals and give back the same quantity of heat in flame above the fire, oftentimes giving the appearance, however, of making a hotter fire. In cases where a long flame is desirable, as in fire under a steam boiler, it is a common practice to wet the coal before firing it, for this reason. These facts will probably help you to explain the phenomenon you have observed.

(10957) M. F. S. says: 1. Would you kindly explain the real meaning of the word "watt"? One says that a 16-candle-power lamp takes 56 watts, say 60 watts for convenience, per hour. If it takes 60 watts per hour, it should take 1 watt to light it for 1 minute. Yet we all know that it takes the full 60 watts to light it even for one second. A 300-watt dynamo does not give 300 watts per hour, it gives them all the time; if such a dynamo were connected with a watt-meter, would the watt-meter register 300 watts after an hour? A. A watt has no reference to time. It is the unit of electric power. And just as a horse-power works right along, a second, an hour, or any other time and is the same horse-power, so the watt is the same for any time. If a lamp requires 60 watts to light it, it will require the 60 watts for a second just as really as for a whole day. What is paid for on the watt-meter is the watt-hours. If 1,000 watts are used for one hour, that is a kilowatt-hour; and if for ten hours, the consumer must pay for ten kilowatt-hours. This too is just the same as the horse doing work. If one hires a horse which might do a horse-power of work, he will pay for the same horse working for the entire time which he does work. The idea seems simple. 2. Does the sun have any direct influence upon the weight of objects on the earth? Example: Will an object be theoretically heavier at midnight than at midday? A. The weight of objects does not vary from noon to midnight because of the position with reference to the sun. The change of distance from the sun in that time is so small as compared with the immense distance of the sun as to be of no value at all.

(10958) F. G. S. asks: Is there any simple formula for calculating the power of a magnet when the size of wire, number of turns, and E. M. F. of battery are known? Will this formula apply in the case of a solenoid? A. The tractive power of a magnet is found by the formula $\text{Pounds} = \frac{T C M \sqrt{A}}{2661 L}$ in which T is the number of turns of wire, C the current in amperes, M the permeability of the iron of the core, A the area of pole pieces, and L the mean length of the magnetic circuit. For a solenoid without iron the permeability is 1, since the permeability of the air is the standard of comparison, and hence is unity. For a straight coil the result will be of little value because of the great leakage of lines of force, and the great length of the circuit of the lines in the air.

(10959) J. H. S. asks: The difference between the work a 5 x 5-inch engine is capable of performing against what a 5 x 6-inch would do, both engines running equal speed, with valve lifts, compression, and all conditions being equal. The direct argument is that if two cars were built identical with the exception of the motor, one to be a 5 x 5-inch and the other to be a 5 x 6-inch direct connected, or in other words one-to one speed, which car would be the fastest provided they were driven to their limit? Also, would you please explain how much faster a 5 x 5-inch would have to run in order to develop the same horse-power as a 5 x 6-inch; also what relation the piston speed bears to the horse-power of a motor. This last subject is one which seems to be very poorly understood; and while the writer is well aware just what relation it does have, we would like to have you give us an explanation of the matter. A. If we may take your last question first as the simpler, the relation of piston speed to horse-power is exactly the same in an internal combustion engine as in a steam engine, i. e., increase of piston speed indicates either decrease of load or increase of power generated in exactly the same proportion in one as in the other. Your first question cannot be quite as positively answered, for the reason that indicated horse-power has not quite the same relation to brake horse-power in internal combustion as in expansion engines, partly, if not principally, for the reason that whereas in the latter the difference is entirely friction in the engine, in the former it includes overcoming of inertia in the three "dead" strokes including compression of the gas. For instance, an ignition at any later moment than the dead point decreases the area of the card, from which, if complete analogy with steam engine indication existed, a loss of power would be presumed, whereas it is found in practice that retarding the ignition up to a certain point increases the power measured on the brake. As far as your question is concerned, however, the difference in power between a 5 x 5 and a 5 x 6 engine at the same R. P. M. would depend upon only two interdependent variables, the mean effective pressure and the stroke. There would be a slightly higher pressure in the 5 x 6 before ignition, on account of a larger volume of gas having been inspired and compressed into the same space, but this may be neglected. For the purposes of calculation we must suppose the ignition to be at a point 1 inch from the beginning of the stroke in both engines, as without knowledge of the period of ignition we cannot otherwise calculate the relative volumes to which the gas expands. In the formula $\frac{plan}{33{,}000}$ = H. P., p in the 5 x 5 engine = $\sqrt{p_1 \times \frac{p_1}{5}}$ and in the 5 x 6 engine = $\sqrt{p_1 \times \frac{p_1}{6}}$ l = in the first case $\frac{5}{12}$ and in the second $\frac{6}{12} = \frac{1}{2}$ Therefore: H. P. of 5 x 5 engine : H. P. of 5 x 6 $:: \frac{5}{12}\sqrt{\frac{p_1}{5}} : \frac{1}{2}\sqrt{\frac{p_1}{6}}$ = 0.186 : 0.204; that is to say, the 5 x 5 engine has roughly 90 per cent of the power of the 5 x 6 at the same speed, and must therefore run about 9 per cent faster under the same load to deliver the same power as the latter. This is, of course, not an accurate figure, which cannot be obtained without a careful test by both indicator and brake, but it is a fair approximation, sufficient, we hope, for your purpose. The inaccuracy lies in the determination of the ratio of expansion.

(10960) A. L. T. asks: Will you be so kind as to inform me if it is possible or impossible to make a so-called permanent magnet out of a pure soft iron, i. e., a magnet, for example, similar to the steel horseshoe magnets as now made? Can a permanent magnet be made out of any iron? I do not refer to the residual magnetism remaining in the field magnets of a dynamo when not in motion. A. Any iron or steel which has once been magnetized does not again lose all its magnetism, except by heating it red hot. Its magnetism is then destroyed. Good soft iron, cast or wrought, will, however, retain but little mag-