ENGINEERING INVENTION.

Heating railway cars forms the subject of a patent which has been issued to Mr. Carter S. Townley, of Gainesville, Texas. A pipe opening to the air in front of the locomotive passes through the steam space of the boiler, and is thence connected by proper couplings with heating drum in the car floors, similar connections being also made with chambers containing calcined line or other chemicals, to dry and heat the air, the current of which is aided by an injector entering the pipe as it passes through the boiler.

AGRICULTURAL INVENTION.

A hillside cultivator has been patented by Mr. Edgar C. Wiley, of Independence, Va. Combined with a central beam are side beams having a pivotal and sliding connection therewith, with other novel features, whereby the plow shanks can be adjusted to throw one share in front and the other to the rear, and *vice versa*, that the front plow may be kept on the lower side, the second plow filling the furrow of the first.

MISCELLANEOUS INVENTIONS.

A churn has been patented by Cyrus M. and Etta E. Dickey, of New Garden, Ohio. This invention covers a simple and inexpensive rocking churn, which may be operated easily and will bring the butter quickly, while it is not liable to get out of order, and may be conveniently and thoroughly cleansed.

A fire escape has been patented by Mr. William Block, of St. Petersburg, Russia. It is light and strong, and adapted to be quickly and securely attached to any form of support, being made preferably of steel wire, the invention covering various novel features of construction and the combination of parts.

A covering for pipes, boilers, etc., has been patented by Mr. William M. Suhr, of Brooklyn, N. Y. It consists of a filling of asbestos fiber, mineral wool, or similar non-combustible material, inclosed in an asbestos paper covering, lined with a wire netting, being designed to prevent loss of heat and to render buildings fire-proof.

A utensil head for canes, etc., has been patented by Messrs. Moritz Stiebritz and Adolph Miller, of Schuetzen Park, N. Y. It consists of a box for matches, with an outside lid and inner cover, and a match igniter outside the inner cover, the latter being also adapted to hold a mirror or photograph on its inner face.

A collection box has been patented by Mr. Ferdinand A. Kittell, of Hollidaysburg, Pa. It has an upper tilting bottom, a lower bottom, and a rotary supporting handle adapted to upset the tilting bottom, the arrangement being such that each deposit made in the box may be separately inspected by the collector.

A device for loading vehicles has been patented by Mr. William B. Dolsen, of Moberly, Mo. This invention covers a novel combination and arrangement of parts in a hoisting apparatus arranged in combination with the vehicle, whereby the team may be utilized in lifting and placing the load in farm or mercantile wagons.

A grain cleaning cylinder has been patented by Mr. William P. Clifford, of Ottumwa, Iowa. It consists of an upper and lower section, the former being of shorter radius, and forming longitudinal inlet and discharge openings, in combination with a beater, and other novel features, whereby the grain can be subjected to any required amount of cleaning.

A can filling machine has been patented by Mr. Conrad Seimel, of Brooklyn, N. Y. It is especially adapted for filling cans to contain Paris green and similar powders, filling the cans rapidly and shaking down the contents in such manner that the dust will be prevented from escaping, while the cans will be made of uniform weight.

A bell cord attachment specially adapted for use in street cars has been patented by Mr. George W. Naylor, of Jersey City, N. J. The invention consists principally in pivoting a lever to the window frame and securing one end of the lever to the bell cord in a novel way, whereby the bell cord may be readily and easily manipulated from the seat.

A coin controlled height measuring machine has been patented by Mr. Charles R. Williams, of Newark, N. Y. It is made with a vertically sliding pointer to be moved up or down by a person desiring to determine his height, with a plate held in front of the pointer and operated on by the introduction of a coin of a given size and weight.

An ink mill has been patented by Mr. T. Ruddiman Johnston, of Edinburgh, Scotland. This invention covers a novel construction whereby the several parts of the mill are rendered easily accessible for cleaning purposes, and the amount of attendance necessary is reduced, while a better grinding of the ink is secured.

A temperature regulator for incubators has been patented by Mr. John W. Hile, of Valley Falls, Kansas. The invention consists in the arrangement of metal plates coupled together around the inner sides of the incubator walls or drawers, whereby the damper or vent will be operated by the slightest variations of temperature within the chamber.

A ditcher and grader has been patented by Mr. James M. Holland, of Mount Pleasant, Iowa. This invention covers a novel form of implement in which the ditching blade or shovel is reversible, and so connected to the wagon or vehicle to which it is engaged that it will be free to conform to the contour of the ground over which it is drawn.

A mast hoop has been patented by Mr. Charles S. Mott, of Patchogue, N. Y. It consists of two semicircular wooden sections and two outer metallic band sections, the two sections hinged together and provided at their ends with a slotted socket and a catch, for the ready connection or separation of the hoop sections without injuring the strength or efficiency of the hoop.

A groove cutting tool has been patented by Mr. William H. Parry, of New York City. It is for gaining stair stringers and similar purposes, and consists of a holding shank, a cylindrical head, and groove cutters having side cutting edges and inclined bottom cutting edges projecting from the outer end of the head, the head and cutters being formed on a single piece of steel.

A mechanical movement has been patented by Mr. Marmaduke B. Kellogg, of San Francisco, Cal. The invention covers a device or machine for converting reciprocating into rotary motion, and is designed for the piston rods and cross heads of engines and motors, being designed with a short piston stroke to multiply the stroke without decreasing the power transmitted.

A steam shoveling device has been patented by Mr. Andrew Meyers, of Port Arthur, Ontario, Canada. A hinged shovel or scoop is mounted on a pivoted inclined way, in connection with a hoisting apparatus, a slide being connected to the lower end of the inclined way and operated from the hoisting apparatus, the machine being specially designed for economically handling coal.

A window blind fastener has been patented by Mr. William Simmonds, of Yonkers, N. Y. Each blind has the ordinary spring fastener, in connection with a staple driven into the window sill, and there is used therewith a cheap and convenient fastening device placed loosely upon each staple, whereby the blinds may be locked in closed position or held partially open.

SCIENTIFIC AMERICAN
BUILDING EDITION.

JUNE NUMBER.—(No. 32.)

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3. A cottage of field stone and wood, perspective and floor plans.
4. Perspective and floor plans for a seaside cottage, cost about five thousand dollars.
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A "practiced hand" has, in this manual, not only described the construction and management of the magic lantern, but tells how to produce many beautiful and startling effects, ordinarily beyond the reach of amateurs. Among some of these are the snow effect, moonlight effect, storm effect, rainbow effect, fountain effect, cascade effect, etc.

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Notes & Queries

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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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Scientific American Supplements referred to may be had at the office. Price 10 cents each.
Books referred to promptly supplied on receipt of price.
Minerals sent for examination should be distinctly marked or labeled.

(1) McK.—Core sand is not made by mixing. For valves use a grade of moulding sand slightly coarser than is used for outside or flasks. Mix it with a little sour beer or very thin mucilage—no more than will make the cores dry hard enough to handle. You can blow out the cores by dipping the castings in water before they are cold. Mixtures for valves should be copper 16 ounces, tin 1 ounce, zinc ½ ounce, lead ½ ounce.

(2) M. E. M. asks how to measure a miner's inch of water. A. A miner's inch of water is the quantity of water that will flow through a hole 1 inch square in a 2 inch plank, the top of the hole to be 6 inches below the surface of the water in the race or flume. This is what is meant by head. If the top of the hole is but 4 inches below the surface, you get less than a miner's inch. The amount of flow for a miner's inch is 11.244 gallons (United States) per minute.

(3) L. J. S. asks: 1. Will a shade tree be injured by having electric light wires in contact with its branches? A. Insulated wires will do no harm. Naked arc light wires may burn leaves and small branches in contact, but they have no other effect on the growth. 2. When the sun and moon are in conjunction, will a body weigh less on the side of the earth nearest them than on the opposite side? A. Yes, theoretically, but the amount is too small for ordinary measurement.

(4) F. H. C.—Horse clippers are usually on the shears principle, and should be sharpened in the same way that shears are sharpened, by grinding the bevel edge only.

(5) W. B. asks how egg yolks are dried, and for what used. Also, where a market could be found. A. The yolks are separated from the white part and then dried in any convenient receptacle at a gentle heat. The article is made quite largely in Chicago, but is more expensive than the foreign article. It is used in the fine leather manufacture and other industries, and by bakers, who employ it to advantage when the price of eggs is high or they are scarce.

(6) J. P. M. asks: Can I cast a brass or copper nut on a square thread screw three-quarters of an inch in diameter, to replace a nut of Babbitt metal which does not stand well? A. You can, if not more than 1¾ inches in length of thread, without the metal seriously binding. Wash the screw with fine clay and heat it as hot as convenient before putting in the mould. Gently hammer the nut if possible to help unscrew it.

(7) L. B. A. asks: 1. Is there any way to waterproof a cloth apron? For waterproofing fabrics see the articles on that subject in SCIENTIFIC AMERICAN SUPPLEMENT, Nos. 58 and 317. 2. Is there anything that I can put into milk that is changed (a little sour) to sweeten it? A. Add a small quantity of finely powdered salt. 3. Is there anything that I can use in my curd or milk to give my cheese a nice flavor? A. Cheese may be flavored with herbs, or decoctions of herbs such a thyme, sage, and the like.

(8) C. B. H. asks how to cut a Turkey oil stone in two. A. You can saw it with sand and water fed to a piece of sheet iron made into a saw without teeth, or quicker with a copper blade and emery and water.

(9) J. P. W. asks: What can I mix with talc to cause it to adhere after grinding the talc for fire brick? A. Use clay, as pure as can be had. Burn as other bricks.

(10) G. C. asks: 1. What pressure would it take to sink a hollow ball that contained 231 in. in water? A. It will take as much pressure as the ball displaces in weight of water (8·35 pounds for 231 cubic inches). 2. In a vessel 23⅛ in. deep, which is filled with water, what would the pressure be on one inch of surface at the bottom? A. The pressure due to 23⅛ in. in depth is 0·833 pounds per square inch. 3. What pressure would it take to compress one cubic foot of air into ⅔, into ¾, into ½, or into ¼ cubic foot? A. Compressing air to ⅔=10 lb., ¾=12½ lb., ½=15 lb., ¼

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