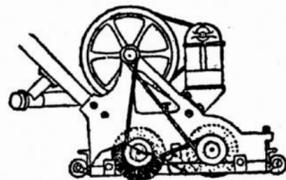


POPULAR SCIENCE

An English Carpet Cleaner.
Years ago the housekeeper was content to sweep the carpet with a broom, but with the invention of the carpet sweeper it was discovered that handling the broom was unhealthy, both for the woman who wielded it and for the unlucky individual who happened to be within reach when her ire was aroused. Soon it was found that the handle of the carpet sweeper could be unscrewed, and so man in his despair has cast about for another device



Electricity Rotates the Brushes.
which would clean the carpets without endangering his health. Hence the electric sweeper. This machine comes from England, and seems to be especially designed for use in large halls and public rooms having such great floor space as to make cleaning them even with the hand operated sweepers a laborious task. In this apparatus a small motor is mounted on the frame, with belting connecting the shafting with two rotary brushes, which are rapidly revolved as the sweeper is drawn over the floor. To effectually prevent the spread of dust an auxiliary frame surrounds the body of the sweeper at its lower edge, with a flexible edge piece bearing against the carpet on all sides.

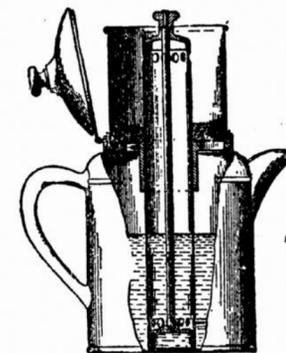
The inventor of this apparatus is Frank J. Farrell, of London, England.

A Wonderful Rule.
H. M. Jones, an architect of this city, has produced a remarkable invention in the shape of a mechanic's pocket measuring rule, on which he has been studying for several years.

He has taken a cheap, common rule, and, without increasing or diminishing its original size, weight, appearance or original usefulness or convenience, has produced a rule that will give the length and levels of the ends of all kinds of braces or rafters.

It will square off a board or square and lay out a cellar, make an octagon or square mitre. It will tell the height of any building or elevation, the depth of any valley or chasm, the width of any street or stream, or both. Anchor a boat in the middle of a river, and the rule will tell how far it is from the shore; a roofer can tell the dimensions of any roof while standing on the ground; it will measure anything in sight, whether in reach or not; it will give the length of any straight or slanting line, it solves all the problems in geometry and trigonometry the mechanic is ever called upon to solve. The improvement can be attached to all kinds of rules in use, whether of the French or English systems, and to a new rule while making. One cent per rule will pay the cost of the improvements; to a rule already made it will cost two cents a rule.—Meridian Journal.

A New Percolating Coffee Pot.
While the coffee pot which makes the beverage by percolating hot water through the finely ground coffee is finding great favor, there is some complaint that one infusion does not make the drink strong enough, necessitating the pouring of the coffee from the pot and passing it again through the



Pumps Water Over the Ground Coffee.

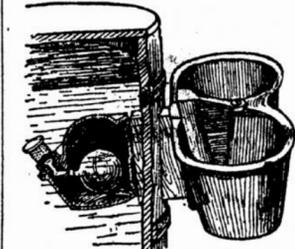
grounds. The accompanying illustration shows a coffee pot recently designed by a Massachusetts inventor, with the idea of removing the necessity for pouring the liquid from the pot preparatory to passing it through the percolator the second time. Instead of pouring the hot water directly on the ground coffee in the percolator, the bottom portion of the pot is filled with the required quantity of water previous to inserting the percolator. In the center of the latter and extending down to the bottom of the pot will be seen a cylinder containing a piston, and by raising and lowering this piston the water is pumped from the pot to the top of the cylinder, falling thence on the coffee and percolating through into the lower chamber again. When the liquid has gained the desired strength the percolator and pump can be removed and the clear coffee is then ready for serving.

Pressure Test of Small Tubes.
An experiment tried by an English naval engineer to test the strength of the small tubes in water tube boilers showed that they resisted the pressure

far beyond any that they could be subjected to in actual use. A copper tube of one inch outside diameter was plugged on both ends and a gauge fastened on. It was set over a blacksmith's forge and steam raised to 2,000 pounds per square inch, when it burst. This tube was 0.07 inch thick, the tensile strength of the metal being only six and a half tons per square inch. A steel tube of one and a quarter inches diameter coiled into a circle of six inches diameter and 0.704 inch thick stood 4788 pounds per square inch before bursting. Through defects in the material they sometimes give way at 300 pounds per square inch.—Iron Age.

New Safety Lamp.
At a recent meeting of the Academy of Sciences of Vienna, Prof. Moilsch of Prague communicated a paper upon phosphorescent bacteria. He has been able to photograph the colonies of a phosphorescent micrococcus by means of its own light. By inoculating large glass flasks of half-litre capacity containing a suitable culture medium with the organisms, a "bacterial lamp" is obtained with which it is quite possible for an observer at a distance of one or two metres to read a thermometer or to see the time of a watch. On a dark night the "bacterial lamp" is visible at a distance of more than sixty paces.

Improved Stock Waterer.
No matter how pure a source of supply may be at hand for watering stock, if it is pumped into an open trough and left exposed for any length of time it soon becomes polluted and unfit for the animals to drink. This will not be the case, according to the inventor, if the stock watering apparatus here shown is put into use. If pure water is furnished to the tank or barrel to which this fountain is attached, it is claimed that there is no way by which the animal that is drinking can make it foul. The waterer consists of a double drinking



Animals Cannot Befoul the Supply.
bowl, made of cast iron, which is attached to the outside of a tank or barrel. On the inside is another chamber, inclosed in which is a brass float and lever, controlling the flow of water to the outside bowl. The fountain is automatic in its action, as the float rises with the water in the bowl and cuts off the supply when the proper height has been reached. As the valve is always closed, except when water is flowing from the tank to the drinking bowl, there is no opportunity for foreign matter to find its way to the interior of the storage reservoir.

Locomotive Fuel.
Inventions, new uses and adaptations are the results of the wants and necessities of the time. The adoption of fuel oil on the locomotives employed on the railroads traversing the interior valleys of some sections of the West has removed one of the chief sources of danger from fire in the ripening grain fields. Locomotives using it do not emit any sparks or eject red-hot cinders to ignite the withered grass along the right of way or the parched grain in the neighboring fields. Henceforth grain field fires will probably pass out of the future history of the wheat-growing valleys; the railroad claim agent's occupation will practically disappear, a big leak in the corporation's treasury will drop to correspond with the diminished risk the use of fuel oil on locomotives has caused. We believe that fuel oils is destined to play no small part in the economics of the future.—Epworth Herald.

Waste Available for Fuel.
Commissioner John McGaw Woodbury, of the Street Cleaning Department, New York City, has received the reports of experts as to the experiments made in the use of street and store sweepings as fuel. He has calculated that there would be 800,000 cubic yards a year which could be utilized by the new process in the making of briquettes for fuel. With this fuel it was estimated that power enough to light 7,272 lamps of 2,000 candle power each for a year could be obtained. Commissioner Woodbury will sell the fuel, and it is announced that some arrangement for the use of machinery of the city to generate and sell power for the pumping stations of the water supply department in the borough of Manhattan might be made.

Weather Signals in India.
Monsoon stations are to be established in India for the purpose of taking observations by means of kites and kite balloons. The first station will be in the Himalayas at Simla, 7,000 feet above the level of the sea.

Maple Cream Candy.
Two cups of medium brown sugar, half a cup of milk, butter size of walnut, boil five minutes, remove from fire, add two teaspoonfuls of vanilla and beat five minutes.

BATTLE SHIP VERMONT WILL BE MOST POWERFUL OF OUR NAVY

The 16,000-ton battleship Vermont, the contract for building which was recently awarded to the Fore River ship and engine company of Quincy, is the very latest type of American sea fighter.

She and her sister, the Kansas, to be built at Newport News, and the Minnesota, to be built at Camden, will be the heaviest warships ever constructed for the United States Navy, and indeed will be surpassed in size by only one vessel in the navies of the world, the 18,000-ton man-of-war Great Britain is now providing herself with.

The ships of the Vermont class, as they are officially designated, are to be 450 feet long on the water line and 156 feet 4 inches long over all, which is about 15 feet longer than our next largest battleships, those of the New Jersey class, of which the New Jersey

the casemate through which the rifles protrude, and the transverse armor, which crosses the hull from side to side, and comes out at the gun ports, is 7 inches thick above the deck and 6 inches below.

The conning tower and its shield are 9 inches thick. The communication tube, through which the conning tower is reached, and which shelters the speaking tubes and wires, is 6 inches in thickness and so is the signal tower, which stands under the after bridge. All of the 3-inch guns are

that have a heating surface of 46,750 square feet above 1,100 square feet of grate surface, and can maintain a working pressure of 265 pounds to the square inch.

Like the other newer large ships of the navy the Vermont will have three smoke funnels and two military masts. When she has her full complement the Vermont will carry, besides her officers, 814 men.

A Wellington Story.
Wellington's grandniece tells this anecdote of the Iron Duke's sense of justice in the just published volume of his letters: "I forget if it was at Walmers or at Stratfieldsaye that he one evening in the drawing room rang the bell several times, and, no servant answering it, he became extremely angry. When at last a footman appeared, the duke stormed, with very



The U. S. S. Vermont, from Design.

and Rhode Island, building at Fore River, are the nearest to completion.

The molded breadth is 76 feet 5 1/2 inches and the extreme width outside the armor 76 feet 10 inches. With a depth of 46 feet, these gigantic steel hulls will draw 24 feet 5 inches of water when two-thirds stores and supplies are aboard.

The main battery consists of four 12-inch breech-loading rifles; two in each of the main turrets; eight 8-inch rifles, two in each of the lesser turrets, and twelve 7-inch rifles, the latter placed on the gun deck and constituting the principal broadside battery. The secondary battery is made up of twenty 3-inch 14-pounder rapid fire guns of 50 calibre, twelve 3 pounders and six 1-pounder semi-automatic rapid fire guns, two 3-inch field pieces, two 30-calibre machine guns and six 30-calibre automatic.

With this tremendous armament there must of course be correspondingly heavy armor. The main belt, along the water line, which is the most vulnerable point, where a shot would do the greatest damage by starting a serious leak or crippling the machines that are the ships vital organs, is 9 feet 3 inches wide amidships, tapering to about 8 feet at stem and stern, and 9 inches thick for 234 feet of its length, reduced in three reductions to four inches at the ends.

The positions of the 7-inch guns are covered with 7-inch armor plate, worked above the main belt and around

sheltered behind 2-inch nickel steel and the steel deck all over the ship is half-inch plating.

The protective deck is covered with nickel steel plates an inch and a half thick on the flat and 3 inches on the slopes, and is backed with 3 inches of oak wood which would act as a cushion and break the force of a shot below, preventing the cracking of the armor if, by any chance, it should be struck at just the right angle for such a mishap.

As if this were not enough, 23 tons of corphit cellulose are stored back of the plating along the water line in a cofferdam 7 feet high and 30-inches wide. Should the shot pierce the ship's skin sufficiently to let in the sea, the contact of the water would immediately swell the cellulose and stop the leak until the vessel could be hauled out and her plating renewed. Furthermore, the double bottom is divided by water-tight bulkheads in such a way that the ship is practically unsinkable.

Of course it takes a tremendous power to move such a mass as this new Vermont at all, to say nothing of sending her through the water at a speed of 18 knots an hour, as the specifications require.

The work of turning the great twin screws is to be done by two four-cylinder triple-expansion engines, capable of developing 16,500 horsepower, supplied with steam from 12 water tube boilers of the latest type

strong language, at his neglect of duty. I, a small child, so far from being frightened, thought it exceedingly funny to see the duke angry and went into fits of laughter. This checked him, and the footman interposed, saying: 'If your grace will look, you will see the bell is broken and never rang at all. I only came in for something else.' The duke examined the bell and then turned to the footman and said: 'Yes, I was wrong. I am very sorry, William, and I beg your pardon.' And then turning to me, added in his gruff voice, 'Always own up when you are in the wrong.'

Senator Spooner's Fine Estate.
Senator Spooner of Wisconsin has bought on private terms the great Blanchard estate, which includes practically the whole town of Pittsburg, the most northern town of New Hampshire, which, it is understood, he will turn into a game preserve. Much of the property is in its natural state and is ideally located for preserve purposes, and added value comes from its inaccessibility, practically absolute privacy being there assured.

Has Money Enough to Retire.
Detective Sergt. William C. Weiser of New York has resigned his office. He admits having \$200,000 laid aside and promises that the hardest work he will do for the remainder of his life will be to clip the coupons off his bonds.

COAST SINKING AT NEW YORK.

But Process is Not Rapid Enough to Cause Alarm.

The United States Geological Survey has lately published various interesting data relating to changes of sea level near New York.

Some tens of thousands of years ago the greater portion of the state was covered by an immense glacier. This ice sheet had gathered up in its course great quantities of sand, gravel and mud.

Part of this burden was pushed in front of the ice mass, and as the front of the glacier came to rest in the latitude of the city the material that was pushed along was deposited. When the glacier melted, owing to the advent of a warmer climate, the mass of material deposited along its front became the familiar rounded hills of Long Island—the so-called backbone of the island.

After the disappearance of the ice sheet the land in the vicinity of the city sank so far that the sea covered points that are now a hundred feet above the ocean level.

During this period of submergence the great brick-clay beds along the Hudson river were deposited. The Haverstraw and Croton Landing beds, now far above water, were, of course, deposited below water.

The next main event in the geological history was a gradual rising of the land until it stood considerably higher than at present, and this rise was followed by a gradual sinking which is still in progress.

Along the coasts of Long Island and New Jersey one may see tree stumps under water that have been covered by the sea within very recent times. The encroachment of the ocean upon the land is still going on.

GAVE CHILDREN ODD NAMES.

Young Kentuckians Who Have No Cause to Revere Their Father.

Some parents seem to have a mania for odd names to bestow upon their children, never appearing to realize that they will subject the young people to all sorts of ridicule through life. "Miss Hell-in-the-Kitchen Hamilton" is the way a Kentucky girl's name appears on her calling cards. And thereby hangs a tale. Many years ago there lived in Nelson county, Kentucky, Louis Hamilton, a reputable farmer. A short distance away there lived another Louis Hamilton. The latter was always in trouble, and frequently the wrong Louis Hamilton was arrested, charged with the other's offenses.

The first named married and determined to give his children names that would never be confounded with others. So he named his first born son London Judge and his second son Reputable Kingdon. Then five daughters came to bless his household, and he called them Southern Soil, Hebrew Fashion, China Figure, Avenue Belle and Hell-in-the-Kitchen.

When the last named was christened the father omitted "the kitchen" portion and the child was christened "Helen." The father, however, called her by the full name.

The Path of Power.

Soul and body, follow me:
Cold and free the mountains gleam.
Leave the vale of silent snow
When the trees o'erhang the stream.

Come, my body, joy of sense
Shall not henceforth be thy spoil,
Leave, my soul, thy fellow-fires;
Who aspires alone must toil.

Festal riot, lure of love,
Up above ye shall not find.
Pine trees foss their spears of black
O'er our track beneath the wind.

Whispering their music dies
As we rise, and now I seek
Lonely wastes of silent snow
Spread below the windy peak.

Mote-like in the vale one stands
Lifting hands to wave me back,
Signs that kindle, eyes that burn
Shall not turn me from my track.

On the ridge the mounded stones
Hide his bones who tried the height,
Though the daylight wane and fall,
I must scale the peak to-night.

Soul and body, can ye fear
When so near my battle ground?
Fear the darkness?—ye would flee
Could ye see where I am bound.
—Philip P. Graves, in The Spectator.

Eye-Strain and Nervousness.

In some cities the nervous child is moving parents and physicians to appeal for fewer hours in the schools and less pressure. We do not much believe in the intellect, the morals or the pedagogics of the colt breakers or the boy breakers. There are better ways to break a horse or a child than to break its will and the teacher that entertains such diabolic theories should be "broken." The noteworthy fact about the whole discussion is the utter omission from a hundred papers and editorials and discussions of the most important element of the entire matter. There are, it is true, many other factors; there is really overstudy and overpressure, but the one cause of the nervous child, which is ignored, but which is as prolific a source of evil as perhaps all others combined, is eye-strain.—American Medicine.

Ugly for Sure.

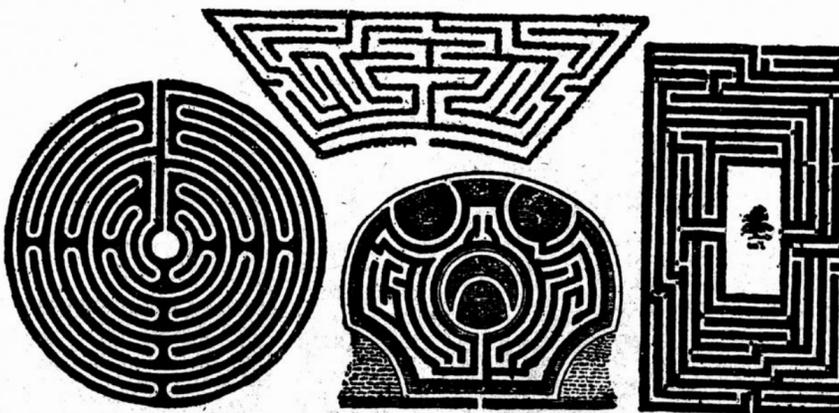
In a mining town in the mountains of Virginia lived two little chaps aged 8 and 9 years, neighbors and good friends, who passed most of their leisure time together in boyish sports, but, like all healthy boys, they sometimes "scrapped."

On one of these occasions the younger one, who was built on the lines of the proverbial man who could not stop a pig in an alley, was being twitted by his companion on his bowlegs.

He stood it manfully for a while, but finally losing patience he blurted out:

"Well, I may be bowlegged, but when the Lord made you He made you as ugly as He could, and then hit you in the face."—Lippincott's.

WELL-KNOWN MAZES IN ENGLAND



Akborough Maze.

Somerleyton Hall Maze.
Hampton Court Maze.

Hatfield Park Maze.

From "Chums" (an English paper) we extract the following regarding some well-known English mazes, or labyrinths. Once upon a time it was the custom to make mazes for the purpose of affording religious discipline. The early Christians were accustomed to follow them as a penance. By degrees this pious practice died out, but here and there some of the old mazes are still in existence. One of the most famous is that at Hampton Court, and thousands of boys have attempted to solve the secret of its

construction. This labyrinth is supposed to have been made in the reign of William and Mary. The hedges originally consisted wholly of the hornbeam. Now, however, holly and yew are intermingled with the hornbeam. The maze covers a quarter of an acre, and the walls of hedges are exactly half a mile in length.

The labyrinth in Hatfield Park is an old one and is formed of clipped yew hedges. One of the most celebrated is at Somerleyton Hall, near Lowestoft. It is perhaps the finest example of a labyrinth in England. Its hedges are

nearly seven feet high. In its centre is a summer house of quaint design. It is only about fifty years old. The maze Akborough, in Lincolnshire, is one of the early type of the mazes. It does not consist of hedges, but is cut in the green turf and is forty-four feet in diameter. As will be seen, there is no puzzle about it. There is only one road to follow. The object of it is to test the patience of the pilgrim. It is merely tiring, not perplexing. This was a form of religious maze. In bygone days no large garden was complete without a maze.