WORLD OF INDUSTRY

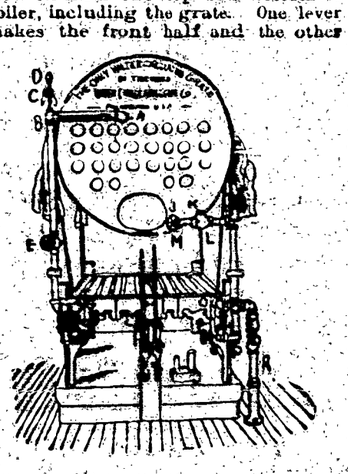
INVENTIONS WHICH WILL LESSEN MANUAL LABOR.

Electrical and Metallurgical Science as Developed by the Giant Geniuses of Two Continents—Marble Produced from Chalk—Tannic Acid Properties.

Water Circulating Grate.

A new water circulating grate is designed for marine, stationary and locomotive boilers, and is adapted for all classes of fuel without change of bars. No artificial draft is required, and the circulation is designed to keep the boilers clean. The operation of the grate is as follows:

R is the feed pipe; O is where the water enters the grate from the feed; M is a valve to shut off blowing surface blow; L is a reversed check which closes when feeding, and supplies the grate with water; J and K are the connections which go through the boiler front and connect on to the bottom of the boiler; G is where the feed water come out of the grate on its way to the boiler; E is a valve which is to be shut when blowing from the bottom; A is where the water is delivered into the boiler, through an inside pipe nine feet in length; B, C and D is an air check which allows the air to escape from the grate when building a fresh fire; F is a blow-off from the top and bottom of boiler, including the grate. One lever shakes the front half and the other



lever the back half of the grate. There are stops on these levers, allowing the fire to be shaken little or much, as desired. When starting to feed at R, the water goes up the pipe to L, the check shuts and prevents the water from going into the bottom of boiler at J, and backs down to G, and enters the grate, running through one bar and then another, coming out at G; it then passes up the pipe to A, and enters the boiler at the top under the water line, through an inside pipe which carries the water and delivers it at about the middle of the boiler. The moment feeding stops, the check, L, is opened from the pressure from boiler, and the water from bottom of boiler takes the place of the feed which is cut off. To blow the grate, open F and shut M; this gives a surface blow from the top of boiler, passing through the grate, keeping it clean of all sediment; as soon as the surface blow has been used enough, let F remain open and open M; now the blowing is at the top and bottom at the same time; the bottom one is sucking the mud from bottom of boiler; shut F, and circulation commences at once. M and F always remain open unless blowing, as they are the two main lines of circulation from grate to boiler.

How Mail Clerks Assist the Memory.

The railway postal clerks have a unique method, says a contemporary, for learning the routes on which postoffices are located. Take, for example, the state of Pennsylvania, in which there are over 5,000 offices. The prospective mail distributer buys a quantity of blank cards—about the size of the ordinary visiting card—and on each of these he writes the name of an office. On the back of the card he writes the name of the route by which the office is served with its mail. Taking in hand a package of these cards—say from 50 to 100—he goes over them one after another studiously, looking at the back each time and getting the name and route clearly associated in his mind. The second time he goes through the pack he finds that he knows the half of the route by reading the name of the office. It is a dull student who upon going over a pack of cards a dozen times does not know them thoroughly. The method is so simple and such an aid to memorizing that it is adopted by all railway mail clerks. By it clerks have been known to memorize a state like Pennsylvania inside of two months.

On all large routes clerks work but half time, the other half being devoted to rest and study. The mail clerk at home, continually reminded of coming examinations, carries his cards wherever he goes, conning them over at every opportunity. One demonstrative clerk of the New York and Pittsburg railway postoffice is famed for having learned the state of Ohio in four days. As he shuffled over his cards he walked from garret to cellar, and vice versa, from dawn until the shades of twilight fell. On the fourth day he went to the examiner's office and separated Ohio without an error.

Cooking by Gas.

In the course of a very successful series of lectures on cooking by gas which Madame Alting-Mees has lately delivered in Brussels, at the invitation of the Belgian association of Gas Managers, she took the opportunity of impressing upon her audience the great importance of a knowledge of cooking to all who are, or are likely to be, at the head of a household. When discoursing, whether in French or in English, on cooking by gas, Madam Alting-Mees shows that she not only understands her subject thoroughly, but also how to place it before her hearers in such an attractive way as to make them understand it. The attainment of this end is something to have achieved. But this lady has higher aims than merely producing a number of excellent cooks with the aid of gas stoves and gaseous fuel. She would have women and girls—and more especially the latter—turn their attention con amore to the culinary art as a very powerful factor in the promotion of domestic comfort and happiness. If they have been reluctant to do so hitherto, because the conditions under which the operations of this department of household management have been altogether disagreeable, such a feeling should not exist in these days, when, as Madame Alting-Mees and others have demonstrated over and over again, both the appliances used and the fuel employed in them conduce to rather than militate against the cleanliness which, as admitted by everybody, it is so highly essential to secure in preparing food for the table.

Hot Blast Furnace 3,000 Years Old.

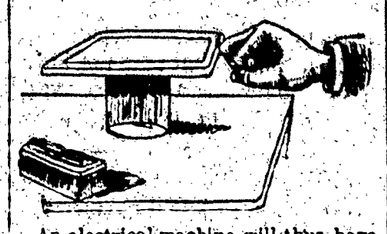
Is there anything new under the sun? asks the Railway Review, and then adds Solomon was right. The more the past is explored the more evident this becomes. A prehistoric blast furnace is the latest discovery! Prof. Flinders Petrie, in 1890, convinced himself that in a remarkable mound called Tel-el-Hesy, in South Palestine, would be found the remains of what was one of the strangest places in the country down to the invasions of Sennecherib and Nebuchadnezzar. The explorations, said Mr. Bliss at the Palestine exploration fund meeting recently, have fully verified this forecast. Amid all the evidence discovered by Mr. Bliss of the civilization of that remote age—wine presses, treacle presses, alkali burnings and innumerable others—by far the most curious is the disclosure of an iron blast furnace, arranged to give strong evidence of being intended to heat, in its descent, a blast of outside air forced through passages before entering the chamber at the level where tuyeres are usually found. "If this theory be correct," says Mr. Bliss, "we find 1,400 years before Christ, the use of the hot air blast instead of cold air, which is called a modern improvement in iron manufacture due to Neilson, and patented in 1828."

A Simple Electrical Machine.

That yellow amber, when rubbed, acquires the property of attracting light objects was known as long as forty centuries ago. This first experiment in electricity was destined for a splendid future, but a distant one, since it is from yesterday only that date the truly serious applications of this science.

We shall now endeavor to show how the fundamental experiments of electricity may be performed with as reduced a material as possible. A sheet of paper will suffice us in the first place for a few interesting experiments. Heat a piece of ordinary paper in front of a brisk fire or over a lamp chimney until it begins to redden. Afterwarp rub it smartly with the hand or, better, with a brush, and it will then be capable of attracting small, light objects, such as fragments of thin paper and the web of feathers. If the sheet of paper be brought near a wall, table or any stationary object whatever it will be strongly attracted. Finally, if one places it above his head his hair will be attracted, while at the same time he will experience a sensation comparable to a slight tickling.

But more remarkable results still are reached upon improving the apparatus. Take a glass, expose it to the fire, so that it shall be perfectly dry, and place it upside down upon a table. Afterward take a tray, perfectly dry, and place it upon the glass in such a way that it shall preserve its equilibrium. Finally, take a sheet of paper slightly smaller than the tray, heat it and rub it rapidly with a brush and it will become quickly electrified. Then place it upon the tray.



An electrical machine will thus have been constructed without any expense. If the finger be brought near the tray, a spark will appear. This spark will be so much the longer in proportion as the glass and tray are drier.

If, while the sparks are being drawn from the tray, the room in which the experiment is performed be darkened, these sparks will appear extremely brilliant.—Science Illustre.

Oil Versus Coal.

Mrs. Stone Burbury of Cowes, Isle of Wight, owner of the yacht Venture, which was fitted with steam machinery, has had this removed and replaced with an oil engine, made by Messrs. Vosper & Co., of Portsmouth. The vessel would not before steam against the strong tides in the Solent, but does so now with ease; she could also only conviently carry sufficient coal for six hours. The oil tank is also placed in a space which was before quite useless, therefore taking up no available room.—Industries.

New Coal Vein in Mexico.

An extensive vein of coal has been discovered thirteen leagues from Pachuca—the present terminus of the Mexican Central's Tula-Pachuca branch line. The coal is said to be of good quality, as shown by all the tests. The lack of cheap coal has always been one of the difficulties with which this company has had to contend. The opening up of extensive coal deposits anywhere near its line would therefore mean an important reduction in the operating cost of the property.

All Over.

Lady (in curio-store)—Does this clock go?

Dealer—Ah, madam, I am so sorry, but that clock is six hundred years old. It has already went.

An Infant Pitch.

Nervous Husband—For heaven's sake, Marial do keep that child from crying. It's enough to drive one distracted.

Philosophical Wife—Be patient, my dear. Life's music would be incomplete without the C-minor cords.

Love and Art.

His heart beat fast, his cheeks grew red
With love that nothing could assuage;
He found that she had turned his head
The while he turned her music-page.

On a Learned Female.

Her wisdom was a wondrous range—
Oh, learned woman who with ease
Her conversation quick can change
From Socrates to bread and cheese!

CITY EDITOR OF THE TIMES.

After Twenty Years' Service Arthur Crump Gets a Pension.

Arthur Crump, who for twenty years has held the important position of city editor of the London Times, has just resigned his position. The responsibilities of the place are very great and Mr. Crump felt that it was necessary to engage in some other occupation where greater leisure and freedom can be obtained. The Thunderer, like the Philadelphia Ledger, is accustomed to pension its more important employes, and Mr. Crump will continue to draw a neat sum from the exchequer of the great establishment of Printing House Square, although he is no longer connected with it. Mr. Crump has done a number of remarkable things during his journalistic career, but his biggest coup was made in connection with the failure of Baring Bros. It is no exaggeration to say that never before or since has a piece of financial intelligence of such tremendous import been the exclusive possession of any one paper. Mr. Arthur Crump, Crump, like many successful men on this side of the water, went into journalism by accident. Originally he occupied a position in the Bank of England. There he was manager of a branch of an English bank at Stockholm and became an active man on 'Change. Here he acquired that practical knowledge of finance and matters financial which made his work on the Times so remarkably successful. The position of city editor in London differs considerably from the same position on a great daily in America. Although Mr. Crump had general supervision of the entire news of the city he gave his special and personal attention to financial news, the greatest feature of the local columns of London papers. Besides doing his work on the Times Mr. Crumb contributed to the Statist and similar periodicals and is an authority on the tariff question.

THE CHEERFUL DOOMED MAN.

On the Scaffold He Generally Acts as if He Were an Injured Saint.

The execution of murderers, barbarous as it may seem, is merely an act of self-defense on the part of the public. It has been seriously asked: "Does hanging prevent murder?" It does. It is a matter of history that cases are very rare where a man is known to commit murder after being thoroughly hanged.

After all, many of the executed murderers do not seem to mind it much. Martin L. Scott, a Montana wife murderer, played cribbage nearly the entire night before his execution. Probably he wanted to peg out consistently.

An Arkansas murderer said on the scaffold that he had become so depraved that he would kill any man for $10, but the Lord had made it all right with him and he was going straight to heaven. Even before his neck was stretched he was able to see a better world than this. This world was certainly better after he was out of it.

An exchange has the following to say about the recent hanging of a Virginia murderer who murdered a whole family for money in their possession:

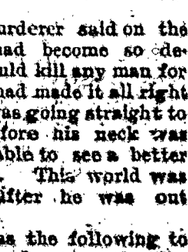
"Capital punishment has no terrors for some human beings. In Wise county, Virginia, the little mountain town of Norton put on gala dress on the day fixed for the execution of 'Doc' Taylor. He had on a suit of white, had the sheriff provide a white cap, preached for an hour and twenty-five minutes from a biblical text and made a 'good preach,' too, according to mountaineer standard. Taylor was a fanatic. Before sentence he began to read from the New Testament, asking the judge to hear his friend, the Lord Jesus Christ.

"After conviction and at the gallows he was in an unvarying fanatical mood, and died with the full belief that he would go straight to heaven."

He also sang "The Bright Angels are Waiting for Me." No doubt they were, as they stirred up the fire with their spiked tails and looked brighter than ever.

A Royal Betrothal.

Duke Ernst Guenther of Schleswig Holstein, the brother of the Empress of Germany, has become engaged to Princess Sibylla of Carolath Beuthen, daughter of Prince Karl. The duke is fourteen years the senior of the young woman. He has lived a life which is not pleasing to his imperial brother-in-law, and recently received a leave of absence from the army, which was almost tantamount to a dismissal. It was then reported that he intended to spend a year or more in this country, but he retired to his estates in Silesia. The princess is a relative of the Princess Carolath who eloped with Count Herbert Bismarck about ten years ago, leaving her husband. Had it not been for the energetic interference of the old chancellor the princess would now have been the wife of the count.



PRINCESS SIBYLLA.

La Grippe in Alaska.

The grip, which reached Unalaska a couple of months ago for the first time in its erratic travels, is now very prevalent among the Indians of northern Vancouver Island. Nearly all the villages are severely afflicted, and a number of the white missionaries are down with the disease.

FIELD OF SCIENCE.

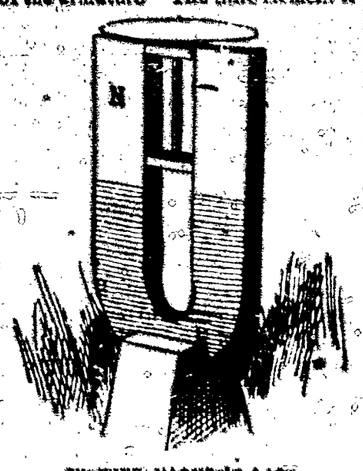
LATEST DISCOVERIES IN INDUSTRIAL FIELDS.

Modern Magnetism Under New Developing Processes—A Device to Teach Spelling—Scientific News Gathered from Many Climes.

Experiment Showing Magnetic Lag.

Most students of electricity know theoretically what is meant by magnetic retardation, or magnetic lag, and electrical engineers and manufacturers of electrical machines understand the causes and effects of this action in the armatures of dynamos and motors, but to most people, and especially to students who really desire to fix an idea in their minds, an experimental demonstration is more valuable than any amount of theory, writes George M. Hopkins, in the Scientific American.

It is of course impossible to see what goes on in an armature while moving, but it is known that the armature core becomes a magnet by induction, and that its poles are of the opposite name to the adjoining poles of the field magnet. It is also known that time is required for the magnetization and demagnetization of the armature. The time element is



SHOWING MAGNETIC LAG.

thus seen to be one which cannot be left out of the calculation in designing dynamo-electric machines.

A very simple experiment, which helps to an understanding of what magnetic lag is, is shown in the annexed engraving. A perforated block is inserted between the polar extremities of a U-magnet to receive a pointed spindle attached to a soft iron disk held near the poles of the magnet. The pointed end of the spindle rests upon a cross bar inserted between the arms of the magnet. The disk, which turns very freely, absorbs the magnetic lines and becomes strongly magnetic. When the disk is at rest, poles are developed in the disk in front of the poles of the magnet, but when the disk is turned ever so little, the poles in the disk are carried forward in the direction of rotation. This is proved by the action of the disk when it stops. It immediately moves a short distance in a retrograde direction, showing that the points of greatest magnetic density in the disk lie beyond the poles of the magnet in the direction of the rotation of the disk, and that these points are attracted toward the magnet poles. Owing to the friction of the bearings of the spindle, and to the almost immediate readjustment of the magnetic lines in the material of the disk, the return movement does not represent the entire lag, but it shows in a striking manner what lag is.

UNUSUAL OCCURRENCES.

While two men in Louisiana were fishing on the banks of a stream they were savagely attacked by two strange animals that resembled wild cats. One of the men lost an arm in the encounter, and the other saved himself by climbing a tree, where he was not followed by the animals.

An unusual case was disposed of in a police court at Atlanta, Ga., recently. It appears from evidence in the case that M. M Bolen was a watchman at the Chattahoochee brick company's yards. The company employed convict help, and one night Bolen eloped with a female prisoner, after stealing some money. They were both captured and arrested.

A fakir with a basso voice and a fluent flow of talk, did business in Washington the other day. First of all he presented the bystanders with a gold plated ring. He next offered them a pair of collar buttons of the same alleged material, again refusing compensation. He finally offered them a set of collar, shirt and cuff buttons for twenty-five cents, and the crowd was not slow in buying the wares. They expected, as in the two former cases, that their money would be returned. It was not, however, and the crowd finally tumbled to the fact that they had been "drawn in" and finally swindled by the fakir.

William H. Graham, who died the other day in Newcastle county, Delaware, at the age of ninety-two, was a drummer-boy in the war of 1812, and as a blacksmith he helped to put together the parts of the first locomotive engine used on the old Newcastle & Frenchtown railroad, one of the earliest railroads in the United States. The locomotive was imported in pieces from England and put together at Newcastle under the eye of a skilled machinist.

CURIOUS AND USEFUL.

Extraordinary stories are told of the healing properties of a new oil which is easily made from the yolk of hens' eggs.

A design for a font of phonetic printing type, consisting of forty-two characters, has been patented by Robert S. Avery.

The Krupp gun works claim to have manufactured a machine which will roll iron so thin that it would take 1,800 sheets to make an inch.

A young Italian scientist, Pinsi, now in Boston, has invented a kind of spectacles by which he expects to make the wearers to see in the dark.