

THE FAIR OF THE AMERICAN INSTITUTE.

NEW ELECTRIC ENGINE.

A new electric engine, adapted to pumping water through a house or to any other light domestic work, is located among the housekeeping articles, and is well worth careful examination. Its construction is novel in many respects. One set of electric magnets is disposed in the direction of their length about an interior rotating cylinder or wheel. The other magnets are arranged in the interior of the stationary case, so that the construction is that of a number of horseshoe magnets, each having one stationary and one movable leg. The long faces of the magnets are serrated to the depth of $\frac{1}{4}$ inch, the indentations of the wheel magnets fitting into those of the case magnets. This, the inventor tells us, has been found, while increasing the area of the faces in contact twofold, largely at the same time to augment the power. The coils are wound lengthwise about the bars, and the yoke of the horseshoe is made directly beyond the outside coil, instead of at the further extremities of the bars, as is usually the case; so that a large portion of the metal core protrudes beyond the yoke. This arrangement, we are informed, has also been found to increase the power as high as 100 per cent. In a future issue we shall describe another electric machine exhibited by Mr. Charles A. Hussey and we shall probably refer to the machine under discussion in detail, and with reference to the new principles claimed to be involved, noting here only the facts given us. Of these the most remarkable are the large capacity of the machine (which contains a 5 inch magnet wheel and weighs but 15 pounds), 8,000 foot pounds per minute, and the statement that a 4-cup battery, costing for materials expended \$1.12, in connection with this apparatus drove a Howe sewing machine at 500 stitches per minute for 60 hours successively.

Builders, owners, and tenants of city houses will doubtless view with interest a

NEW SYSTEM OF PLASTERING

which is claimed to prevent the sudden and disastrous downfall of ceilings, so frequently occasioned by defects in the water pipes and consequent leakage or overflow. The invention consists of replacing the scratch coat and brown coat used in ordinary work by the combination of fibro-ligneous sheets with a cement composed of lime, sand, and plaster. The sheets are of a fabric resembling coarse bagging which is secured to the lathing, and the cement is supplied in the ordinary way. A hard finish coating completes the work.

A NEW FORM OF HAIR HEADER

is exhibited, which is an improvement on the similar apparatus shown at last year's fair. It consists of a vertical oscillating metal plate, the lower edge of which is provided with a rubber facing. Beneath is a horizontal vibrating plate having a rubber surface directly under the edge of the vertical plate. The tangled combings of long hair are placed between these moving portions; and by the rubber, engaging, when rubbed along contrary to the grain of or to the direction of the asperities on the hair, the "knotted and combined locks" are caused to part and separate. This hair header is called "magnetic," for no reason that we can perceive other than that given by the old lady who admired the noun "Mesopotamia," "it was such a nice, comforting word."

AN AID FOR GOING UP STAIRS.

Here is something for the denizen of the aerial flat, an invention supposed to bounce him up from one stair to another until he reaches the top of the flight, before he knows it. Each stair has a hinged lid and under each lid are some strong coiled springs. The inventor fails to say anything about the effect of his springs when a person runs down the steps. The idea suggests itself that an inexperienced user might try to go down two steps at a time, in which case his momentum would probably compress the spring sufficiently to jump him back three steps, and thus, by a kind of algebraic addition, he would find himself slowly retrograding in spite of his efforts to advance. There is food for sombre reflection in those spring stairs.

A NEW HYDRAULIC MOTOR

for sewing machines is exhibited, which is easily attached to the table of the apparatus and which is driven by the ordinary head of water in the service pipes. It consists simply of a winged wheel placed horizontally and enclosed in a case. Motion is governed by the treadle, and speed, of course, regulated by the water cock.

ANOTHER NOVELTY IN MOTORS

is a peculiar compression engine, driven by hot air, now in operation in the machine department. It consists of two cylinders, one for power, under which the fire is built, the other simply for compression. The latter has a water jacket, and both cylinders have pistons, or more properly, plungers. The piston of the compression cylinder passes through packing at the top of the same, but below fits loosely in the bore, so that the air compressed is at liberty to pass up around the piston, and to enter a connecting passage, which leads it into the power cylinder, where it is heated and expanded, and so lifts the piston. As the two pistons are set on cranks 180° apart, the down stroke of the power piston corresponds to the up stroke of the compression piston, so that the air, which just before has been expanded, is now returned to be recompressed and again used. Thus the air is merely shifted from one cylinder to the other, and its cooling or heating is quickly accomplished through its being exposed to the action of the cold water or the fire in thin annular sheets. The machine (1 horse power), we are told, burns very little fuel, one scuttful answering for an entire day. The expenditure of oil is also very small. This seems to be a very simple apparatus, and one well adapted for a large number of

light uses. It is almost entirely free from the disagreeable noise usually incident to caloric engines.

We notice a new

MACHINE FOR POLISHING MOLDING.

which seems to perform very good work. It has an adjustable table, carrying horizontal rubber rollers, which grasp the strip of molding and present it to the action of a reciprocating polisher. This last is a composition of fine emery, which is made in a plastic state and applied to a piece of molding similar to that to be polished. The result when the composition is hard is a perfect matrix, into which every indentation or projection of the molding fits. The cast is then mounted in a box and rubbed to and fro on the molding, as the latter, as already explained, is carried beneath it. The advantage gained is the increased sharpness and accuracy of the edges, and the thorough polishing of the whole work, a proceeding of some difficulty by the ordinary use of sand paper.

A new convenience for housekeepers is a combination

KITCHEN SAFE,

in which places are provided for a multiplicity of articles which generally go astray about the kitchen. Besides, it offers to the cook the same advantages as the prescription counter does to the druggist. There are drawers for the sugar, spices, and similar staple ingredients, a hinged dough board in the front, a convenient receptacle for flour or meal in the top (with a hopper below, fitted with a valve so that exactly as much flour as is needed may be measured off), a sifting arrangement, and plenty of extra closet room for the thousand little things needed in culinary operations. A

NEW ANTI-FRICTION METAL

has appeared, which, we suppose, is intended to rival the material which raised such a breeze among the fair officials last year. It differs, however, in that, instead of being inserted in the bearings, the bearings themselves are made of it. No machinery fitted with the substance is running as yet at the fair. The basis, according to the circulars, is black lead, which is another point of difference from its older competitor into the composition of which black lead enters very slightly, and in many cases not at all.

(From the Engineering and Mining Journal.)

Extra Large Lap-Welded Tubes and Enamelled Water Pipes.

At a recent visit to the National Tube Works Company at McKeesport, Pa., we witnessed the operation of making lap-welded tubes of such a size and quality as to call for notice. The company makes these seamless tubes or pipes of any size up to *fourteen inches diameter*. And as every length is tested by hydraulic pressure before leaving the works, their strength and quality is fully guaranteed. They have been found admirably adapted to carrying water for the hydraulic mines of California, Nevada, and other Western States, and for waterworks which do not require larger mains than 14 inches. The company has just completed an order for the Virginia City and Gold Hill Water Company, of Nevada, of seven miles of 10 inch pipe, the most extensive order for a large size that, we believe, has ever been given in this country. These seamless pipes, even without coating, are more durable and are also less expensive than the riveted pipes; but the company applies a patent enamel to them that, it is claimed, makes them almost indestructible, and, indeed, the company is willing to guarantee their durability for any length of time. The appended reports by Dr. S. Dana Hayes, Massachusetts States Assayer and Chemist, and Professor Otto Wuth, of Pittsburgh, Pa., fully establish the claims of this pipe to durability. We commend it not only to our gas and water companies, but also to our mine owners and others who have to use or convey impure water, such, for example, as in many anthracite mines. These large pipes would make excellent screen shafts for our coal breakers, and the enamel would doubtless be of great advantage for coating the exposed iron work about the mines.

In bringing the matter to the consideration of "those whom it may concern," we believe we are doing consumers as well as manufacturers a service.

REPORTS.

"I have recently made a series of tests of your enameled pipe, for the purpose of ascertaining its value as a service pipe for conveying water and other fluids, and now submit the following brief report of the results obtained:—

"Portions of the enameled covering itself were first removed from several pieces and submitted to chemical analyses, to determine the presence of deleterious substances; but the results of these analyses are entirely negative, as there is nothing of this kind present. The pipe is made of wrought iron, covered, inside and outside, with an elastic, enamel-like material that does not contain any unwholesome or objectionable ingredients.

"Its durability was then tested by exposing different pieces of the pipe to the solvent action of hard, soft, and sea waters, alcohol, and other fluids, for many days, and finally those fluids were boiled in the pipe for several hours in each case—the object of this boiling being to obtain, as nearly as possible, in a comparatively short time, the effect produced in the pipe by long continued usage. These tests have been very complete, and I am quite surprised at the durability and power of resistance of the enamel covering, determined in this way. It has not failed in any trial with natural waters in my laboratory, and it has withstood the action of boiling corrosive fluids for a longer time than specimens of other water pipes now in common use.

"I commenced this investigation with some doubts about your enameled pipe, but the severe tests which I have employed prove that it is perfectly harmless and possesses great durability, these being the properties of most importance in water pipe.

S. DANA HAYES,
State Assayer and Chemist, Massachusetts."

"I have made a complete series of tests in order to ascertain the quality of your patent enameled pipe, and found that the enamel, covering perfectly both the inside and the outside of the wrought iron pipe, is not in the least affected

by the action of alkalies, acids, salts of any composition, alcohol—in fact, any liquids which in practice are apt to be conveyed through the pipe. The enamel itself contains no deleterious substance whatever, and even if it did it would not make any difference, as not a trace of it will become soluble. Pipe so enameled is especially adapted for water and gas.

Yankee Electrical Spread Eagleism.

"At the annual meeting of the British Association for the Advancement of Science, held at Bristol, on the 25th of August last, Sir John Hawkshaw, F. R. S., the newly elected President of the Association, as usual, delivered an address. In the course of this address he took occasion to review the history of the invention and progress of the electric telegraph. This portion of his speech is as perfect a specimen of the insular egotism for which his countrymen are noted as we have seen for some time. He completely ignores, in this connection, the discoveries and inventions made by Americans, merely incidentally referring, in a foot note, to the date of the first patent of Professor Morse, issued in October, 1837. With this exception no mention is made of any American; and so far as can be learned from his address, nothing has ever been done in this country for the development of electrical science or of the telegraph.

In view of the fact that the first practical telegraph line of any extent was built and operated in this country by Mr. Harrison Gray Dyar, in 1826, on Long Island, in this State, over which dispatches were actually transmitted, and that most of the more important telegraphic inventions and improvements have been made here, and by Americans, this omission is discreditable either to the speaker's fairness or to his intelligence. While we have no disposition to withhold from the many eminent electricians and telegraphic inventors of Great Britain the credit which is due them, we are certainly not willing to allow such a slight as that which President Hawkshaw has shown to go unnoticed or unrebuked.

It is in this country that most of the useful improvements and new adaptations of the telegraph have been made, and these have been gradually adopted in Europe until most of their telegraphs are worked upon American systems.

The comparatively slow and inefficient needle telegraph of William Fothergill Cooke, not "Wheatstone and Cooke," as President Hawkshaw has it, has been generally superseded, even in England, by the Morse system, and this is supplemented to some extent by the printing telegraph of Professor Hughes, an American, which is also very extensively used on the continent of Europe. The duplex system of Mr. Stearns, an American, is also being generally adopted on the English and Continental lines. The automatic system of Professor Wheatstone, which is highly praised, is known to be as much behind the American automatic system of Mr. Little, in successful operation in this country, as is the needle telegraph behind the Morse and printing telegraphs. The fire alarm telegraph system is the invention of Messrs. Farmer and Channing, both Americans; the quadruplex has been made practical by Americans; all the printing telegraph instruments which have proved of any value are the exclusive inventions of Americans; the quotation telegraph systems; the automatic fire telegraph system, by which instant notice is given of the commencement of fires, which has proved of great importance and value, is the invention of an American; the district telegraph system, by which messages can be summoned, policemen called, etc., has been invented and perfected by Americans; and the harmonic electric system, by which not merely four, but there is every reason to believe at least sixteen communications can be simultaneously transmitted through a single wire, is the invention of Mr. Elisha Gray, of Chicago, also an American.

Some of the first electricians of the world are also Americans. Professor Henry, of the Smithsonian Institute at Washington, an American, invented the intensity electromagnet, by which the transmission of telegraphic signals on long circuits became practicable. Messrs. Farmer, Channing, House, Page, the latter the inventor of the so-called Ruhmkorff coil, and many others eminent for ability as electricians, are Americans; but these are coolly ignored by the orator, who has never heard of any achievements in electrical science except those of certain British scientists whom he names, save by a few Germans, to whom he grudgingly accords some small credit.

In no other country has telegraphy acquired such perfection in actual use or been so universally adopted and used by the people as in the United States and Canada. More actual business is transmitted daily on a single circuit by two operators in this country than by four operators on two circuits on the English lines. Business is dribbled over the English lines slowly by means of needle telegraphs or by Morse registers, the use of which is universal there but exceptional here; and the automatic telegraph of Wheatstone gives a speed of seventy to eighty words per minute in actual business against 1,200 to 1,500 words per minute by the American automatic system. Only in cable telegraphy can any practical superiority be shown on the part of British electricians and telegraphers, and this arises from the fact that in the United States we have had no long submarine cables to operate. We consider it quite probable, however, that if the speed of transmission is hereafter materially increased over such lines it will be through American inventions, and had the cable telegraphs of the world centered in New York, as they have in London, we believe that our electricians would, before this time, have devised some method of transmitting through long submarine cables more than seventeen words per minute."—*The Telegrapher*.

If Sir John's address savors of egotism, nothing of the sort can be charged upon the *The Telegrapher*. The native modesty of the Yankee is proverbial, and the above prettily illustrates his method of practice.