Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW, NEW YORK.

O. D. MUNN. A. E. BEACH.

TERMS FOR THE SCIENTIFIC AMERICAN.

One copy, one year, postage included..... $3 20
One copy, six months, postage included 1 60

Clubs.—One extra copy of THE SCIENTIFIC AMERICAN will be supplied gratis for every club of five subscribers at $3.20 each; additional copies at same proportionate rate. Postage prepaid.

☞ Single copies of any desired number of the SUPPLEMENT sent to one address on receipt of 10 cents.

Remit by postal order. Address
MUNN & CO., 37 Park Row, New York.

The Scientific American Supplement

is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly every number contains 16 octavo pages, with handsome cover, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, $5.00 a year, postage paid, to subscribers. Single copies 10 cents. Sold by all news dealers throughout the country.

Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year, postage free, on receipt of *seven dollars*. Both papers to one address or different addresses, as desired.

The safest way to remit is by draft, postal order, or registered letter. Address MUNN & CO., 37 Park Row, N. Y.

Scientific American Export Edition.

The SCIENTIFIC AMERICAN Export Edition is a large and splendid periodical, issued once a month. Each number contains about one hundred large quarto pages, profusely illustrated, embracing: (1.) Most of the plates and pages of the four preceding weekly issues of the SCIENTIFIC AMERICAN, with its splendid engravings and valuable information; (2.) Commercial, trade, and manufacturing announcements of leading houses. Terms for Export Edition, $5.00 a year, sent prepaid to any part of the world. Single copies 50 cents. ☞ Manufacturers and others who desire to secure foreign trade may have large, and handsomely displayed announcements published in this edition at a very moderate cost.

The SCIENTIFIC AMERICAN Export Edition has a large guaranteed circulation in all commercial places throughout the world. Address MUNN & CO., 37 Park Row, New York.

VOL. XXXIX., No. 22. [NEW SERIES.] *Thirty-third Year.*

NEW YORK, SATURDAY, NOVEMBER 30, 1878.

Contents.

(Illustrated articles are marked with an asterisk.)

TABLE OF CONTENTS OF
THE SCIENTIFIC AMERICAN SUPPLEMENT
No. 152,
For the Week ending November 30, 1878.

Price 10 cents. For sale by all newsdealers.

THE HOSMER MOTOR.

The daily press is just now considerably exercised about an alleged new magnetic motor, said to have been invented by Miss Harriet Hosmer, the artist, and claimed by Mr. J. Linton Chapman, Dr. O. H. Needham, and there's no telling how many others, as their own individual invention. From one point of view the energy of the rival claimants is irresistibly funny, seeing that no understandable description of Miss Hosmer's alleged invention has yet been made public. From another point of view the rival claims are not at all surprising, inasmuch as multitudes of beginners in electrical science appear to be working on the same problem which report says Miss Hosmer has solved: namely, to make a machine which will run itself chiefly or wholly through the agency of a permanent magnet. This office is almost daily in receipt of letters from such inexperienced experimenters asking what substance can be used to neutralize the force of a permanent magnet: that given, their new motor, they say, will be a perfect success, and the biggest thing out. We have, unhappily, been unable to furnish the needed information.

Mr. Chapman, who is quite sure that Miss Hosmer will not claim the discovery as her own, says until his patents are secured, he must decline to say just what the invention is. Yet he claims to have discovered "a new, unknown, perfectly novel force, generated by a permanent magnet, which can be used as a motor." And, again, he says: "My invention is a motor, not a machine requiring force to propel it. It generates force."

The history of the search for perpetual motion by self-motive power is full of just such discoveries and inventions; and Mr. Chapman is by no means the first to solve the problem by means of a permanent magnet, to the inventor's own temporary satisfaction, and the astonishment of the inexperienced.

In justice to Miss Hosmer, however, we must say that we do not believe that she is engaged in quite so foolish a search, though she appears to have been so indiscreet as to employ Mr. Chapman as her agent to go to London to superintend the construction of her machine. Her claim, according to the correspondent of the *Evening Post*, is the discovery of a new application of a permanent magnet, whereby any amount of power can be secured at a small cost. Mr. J. A. C. Gray, of this city, recently from Rome, where Miss Hosmer's experiments were carried on, has given to a reporter a letter from Miss Hosmer, which gives a clew to the probable nature of her invention. Speaking of her motor, Miss Hosmer says:

"All doubt about its working, my dear friend, is, I believe, absolutely at an end. Mr. Chapman says, in a letter received three days since: 'It goes. I have seen it go with my two eyes. And if it only moves, it is sufficient to prove the efficiency of the principle; but it more than moves, and we can put on as much force as we like.' He says: 'We can get great force in a small space, and there is no limit to the layers of —— and —— we can attach when we want power.' The blanks you know how to fill up. I do not venture to put the names upon paper."

The "layers of —— and ——" clearly indicate a battery of some sort, which removes the invention from the disreputable category of perpetual motors generating their own force. It does not follow, however, that the invention is to sustain the extravagant claims made with regard to it. The fact that it goes is no proof of its efficiency, nor of its novelty, as will be shown further on.

Another gentleman who pretends to know all about it, Mr. T. C. Clarke, of Philadelphia, says that "it is not a perpetual motion, but it dispenses with batteries, and draws its power directly from that great magnet called the earth." What function the "layers of —— and ——" fulfill, in this case, does not appear. That the natural magnetic currents of the earth can be drawn upon sufficiently to keep a machine in motion is not at all improbable; in view of their great feebleness, however, the probability of getting any excess of power for economical work that way does not seem to be alarming.

The first account of Miss Hosmer's invention gave the impression that it was self-containing. If this be true, the "layers of —— and ——," in all probability, form what is called a dry pile. Some years ago, a very clever little self-running machine involving this principle was exhibited at a prominent optician's in this city. The pile was adroitly concealed, and was sufficient to keep the machine moving for a long time.

One of the most successful dry piles is Zamboni's. In this the electro-motors are tin or silver and binoxide of manganese. A piece of paper is tinned or silvered on one side, and the other is coated with finely powdered binoxide of manganese, by rubbing the powder on the slightly moistened paper with a cork. Disks of this paper are then piled up, so that the metal of each disk is in contact with the binoxide of the next. The pile is then pressed into a glass tube, closed at both ends by brass caps, which serve as poles. In a pile containing some hundreds or thousands of couples, the electric tension is considerable; and though the current may be strong enough to operate a machine deriving most of its power from permanent magnets, the energy available would be neither great nor economical. The action of such a pile, however, is remarkable for its permanence, and a machine so constructed might run itself for several years, though not to do any work.

The Hosmer motor may involve some device of this nature, in which case the fact of its running would be no proof of its utility. It is possible, on the other hand, from Mr. Clarke's assertion, that some form of the well known earth battery is employed, and a delusive voltaic current obtained and mistaken for the earth's natural magnetic currents. Quite a number of applications of the earth battery, running back as far as 1838, were described in the SCIENTIFIC AMERICAN, January 30, 1875. A plate of zinc and one of copper, or a bag of coke, buried a little apart in moist earth, have been used to furnish the current for electric clocks. The sole merit of the arrangement of such a battery lies in its being out of the way and requiring no attention. An ordinary small cell will do much work. An improved earth battery, consisting of a series of elements buried in the earth and connected together, and claimed to give intensity of current as well as quantity, was patented by a Brooklyn man in 1874.

THE SALISBURY FURNACE FOR PETROLEUM.

The exhibition of the Salisbury method of using petroleum, or rather the residuum of petroleum, as a fuel, which has been held at the Brooklyn Navy Yard since May last, was varied a few days ago by a trial which resulted as might have been anticipated.

After months of work, which developed the inefficiencies of the apparatus and process, and after a wide circulation of the most extravagant claims on the part of the exhibitor, an application of his process was made to one of the boilers of the machine shop of the marine pattern.

After the fire box was well heated with coal, petroleum residuum was injected into it by a jet of hot steam; the residuum, supplied from an elevated tank, was liquefied by the heat from a coil of steam pipe placed therein; the injecting steam was superheated by passing through a coil of pipe laid in the fire box of another boiler; the air used to assist in combustion was forced, by an auxiliary jet of steam, through a section of six inch pipe arranged in the fire box of the experimental boiler, and the coal fire throughout the trial was kept up with the expenditure of about 250 lbs. of coal.

It is estimated that for each pound of residuum burned an average of about 9 lbs. of water was evaporated from 212° Fah., the amount ranging from 8 lbs. or less to about 12 lbs., and this with all the help given by the coal, hot air, and superheated steam. So defective and unsatisfactory were the apparatus, method, and results that the trial was continued but seven hours.

This six months of work, then, has determined nothing respecting the merits of petroleum as a fuel. It was called a petroleum process, but no petroleum was used; chemical and calorific effects were claimed for it which are not possible or even desirable to any process. It was promised by the operator to remove forever the obstacles and make pleasant the ways of the iron and glass manufacturers, the steamship owners, the petroleum producers, the gas consumers, and all others troubled by the quality or cost of coal or gas.

A more efficient method of bringing disrepute upon legitimate petroleum processes could hardly have been devised, and so great is the difference between the promise and performance that one is at a loss to determine whether the whole work should be ascribed to blundering ignorance or careful intent. The manipulations and the results permit of either interpretation.

Danger from Lubricating Oils.

From a paper read by Professor John T. Ordway, at a recent meeting of the New England Cotton Manufacturers Association, it appears that many of the oils used for lubricating machinery may be classed as dangerous, because when heated to a sufficient degree they throw off an inflammable vapor. In this respect it is claimed that some of the animal and vegetable oils are even more hazardous than those which are partially mixed with earth oils, and that the higher price of an oil is by no means a guarantee of its safety. An account was given of a fire last summer in the Bates Mills, Lewiston, Me., at which the flames, on reaching the weaving room, shot across it in all directions on a level of about five feet from the floor, and with sufficient heat to melt the lead connections to a gas meter located on the same plane of height—from which the gas had fortunately been shut off—while a towel hanging two feet below this level was not so much as scorched. This was thought to show that there was a body of inflammable vapor hanging in the air, cast off by the oil used on the machinery. Apart from the danger of fire, the transformation of oil into vapor is a waste of material which every manufacturer would gladly prevent, and it will therefore be of interest to all who have to use lubricating oils to know that experiments are to be made for the purpose of finding out some ready and simple means of testing the evaporating properties of oils, so that any one buying them can quickly judge of their qualities.

THE first cargo (of wheat) this summer has been brought by sea from Siberia to Hamburg on a Danish vessel, the Neptune. She made the voyage from Hammerfest, on the northern coast of Norway, to the mouth of the Ob, where she loaded, and back again in five weeks, and without experiencing any great difficulties, by following closely the instructions given by Prof. Nordenskjold, from his first Arctic expedition.

NO FAMILY who can possibly afford it should fail to have upon their table two of the best papers printed in the English language—the SCIENTIFIC AMERICAN and the *Christian Union*.—*Janesville (O.) Recorder.*