dollars per day. From these figures (which do not include the original cost of the logs) some idea of the expenses of the business can be derived.

THE NAVAL CONTROVERSY.

In the last number of the SCIENTIFIC AMERICAN we made brief allusion to the fact that the war of words between the Navy Department and Mr. E. N. Dickerson, of this city, had resulted in a challenge, and stated that Mr. Dickerson had not accepted the same at the time of publication. He has since consented to a trial of his engines against those designed by the Navy, but protesting that the results will prove nothing. We find the following letter in the daily *Times*. It appears to be semi-official, and contains a clear statement of what the Department expect to do. When the trial takes place, we shall give all the facts in the case.

WASHINGTON, Aug. 1, 1865.

Several letters have recently been published on the subject of the machinery of the United States steamer *Algonquin*, written by E. N. Dickerson, Esq., of New York. Since he has thus brought the matter before the public, the following facts, from official sources, may be of sufficient general interest to warrant their publication:—

Mr. Paul S. Forbes, a wealthy merchant, and a patron of Dickerson, sought and obtained from the Navy Department, in March, 1863, a contract to construct the engines and boilers of a double-ender, according to Dickerson's patent, to compete with similar machinery designed by Mr. Isherwood, the Chief of the Bureau of Steam Engineering in that Department. The prize was to be the same, and the contract contains the following guarantees, namely:—

It is further agreed, and mutually understood, that the variations from the specifications [of Mr. Isherwood's machinery] hereunto attached, and forming part of this contract, are to be in the dimensions and arrangement of the cylinder, and such parts as are thereby affected; in the design of the valve-gear; and in the design and arrangement of the boilers; and also in the surface condenser.

These changes are not to increase the weights of machinery, nor the space occupied by it, nor to decrease the weight of coal carried in the bunkers within the limits allowed for the engineer department, with the machinery described in the attached specifications.

And it is also agreed and mutually understood that, if, on the completion of the machinery and a careful trial thereof by such persons as may be directed by the Secretary of the Navy, it shall be found by them that its performance, either in amount of power developed, or in the cost, pro rata, of that power in coal, is less than those of the machinery described in the attached specification, they, the said parties of the first part, will remove it, and replace it at their own cost, with the machinery described in the attached specifications.

These terms show that the contract requires simply this: The dep rtment to ascertain by usual tests—first, the maximum power the two competing systems can be made to develop; second, the cost of the power, pro rata, in coal. The usual tests are the measurement of the power developed by means of the well known "indicator," employed the world over for this purpose, and the weighing of the coal. The division of the first into the number of pounds of the latter consumed per hour, is the solution of the problem. This, the department has ordered to be done by a board composed of persons than whom none are supposed to be more competent. The machinery of the *Winooska* was selected to compete against that of the *Algonquin* simply because the *Winooska* was the most convenient vessel of her class at command.

The trials are to be made at the wharf with the paddle surface sufficiently reduced in diameter to enable the engines to work off all the steam that can be obtained from their boilers, and are to be continued 96 consecutive hours to give a reliable mean, which cannot be obtained from short trials. The powers developed are to be measured by the "indicator," the coal is to be taken from the same pile and carefully weighed as it is used, but before being carried on board, so that the draught of water and dip of wheels of both vessels will remain constant, and be the same throughout the trials.

The test is not of the speeds of the two vessels, for they are duplicates, and are to have duplicate wheels by the express terms of the contract and specifications. The test is simply whether the boilers, condenser, and valve-gear of the *Algonquin* are equal to, better or worse, than those of the *Winooska*, and the trial, as directed by the department, will not only conclusively show these facts, but how much better or worse. By making them at the wharf they can be continued longer, be made in a really philosophic manner with strict accuracy, and be witnessed by all who may feel interested in them, which could not be the case were they made in the river or at sea.

The Navy Department has not accepted a challenge from Mr Dickerson; it has no correspondence with him and has nothing whatever to do with him, but is simply carrying out the provisions of the contract with Mr. Forbes, to determine whether the engine shall be accepted and paid for, or whether it shall be removed from the vessel. The contract does not provide for a trial of speed at sea. The vessels being the same, the result arrived at in the proposed trial will, however, unerringly determine which is the fastest vessel. The Navy Department will not be swerved from its duty to the contractor, or led into any controversy with Mr. Dickerson by any public statement of the latter. JUSTITIA.

Train Oils.

The different oils that go under the one name of train oil, may be classified as follows:—A. That which is made from fish. This is made from the lard of the great marine animals, such as whales, sea-dogs, seals, etc., and sometimes even made from herrings. The quality will vary according to the peculiarity of the animal it is made from. The oil mostly in use,. and known under the name of "Southern Sea Train Oil," is made from seal. The quality will also vary according to the preparation. B. Whale oil. This is of a brown color, is quite transparent, and when boiled with rarified sulphate acid, will throw out brown flakes. The liquid is not very thick and does not smell as bad as the following oils, which are obtained by fermenting the lard. C. Sea-calf's oil. This oil is of a pale brown color, much thinner than the former, is transparent, and when boiled with sulphate acid, will gradually settle to the bottom. D. Dog-fish oil. This is of a dark brown color, is much thicker than both the former, but its smell is unbearable. E. Herring's oil. The herrings are boiled in water and constantly stirred; when they are thoroughly cooked cold water is poured in; this brings up the oil to the top, it is then taken out and filtered and put into casks. Sweden is almost the only place where this oil is produced. F. Cod oil. This is made from the liver of the codfish, and is mostly manufactured in Helgoland and in Bergen. There are two kinds of it, one is white, the other brown. The white is obtained by melting the fat, not on fire, but merely by exposing it to the sun. It has the appearance of poppy oil, pale and yellow. It has a sweet taste, but when mixed with reagent, tastes somewhat acid. It dissolves in spirits of wine, and is much used in medcine.

The second sort is extracted by boiling the liver; its color is brown, and the fluid thick, and has a very offensive smell, and a cutting, bitter taste, but is easier dissolved in spirits of wine than the former. When boiled in water it throws out flakes, and more so when mixed with sulphate acid. The flakes, when dissolved in turpentine, or spirits of wine, show that gall fat is mixed with it. Its specific weight is 92. G. Dolphino oil. This is produced by melting the fat of the dolphin in hot water of 60°. Its color is pale yellow, has the smell of sardines, but, when exposed to the light and fresh air, it loses the offensive odor, and changes the color, first becoming brown and then almost colorless. This train oil is dissolved by adding five parts of boiling spirits of wine.—*Gerber Courier.*

Raising the "Congress" Frigate.

An attempt to raise the wreck of the frigate *Congress*, sunk by the *Merrimac* in Hampton Roads, has been partially successful. On the portion of the wreck which was recovered are two rusty guns, covered with oysters and barnacles. The woodwork is, of course, rotten and worthless, but the great amount of metal in and about the wreck will be quite valuable. Several pieces of coin have been found on the deck, which are prized highly by the finders, and will be treasured as relics of peculiar value. Several naval buttons were picked up, and at once fastened to watch guards. Among other things, one of the spectators found a complete set of artificial teeth. No human remains have as yet been recovered.

Magnesium Light for Telegraphs.

On Tuesday last some experiments with the magnesium light were made on board the *Great Eastern*, off Shoeburyness, by Capt. F. J. Bolton, of the 12th regiment. The night was windy, but signals were transmitted to and received from the shore at Shoeburyness, a distance of about six miles. This system of telegraphing, in which an alphabet on the Morse principle is used, bids fair to become universal, the Board of Trade being about to introduce it into the commercial code of signals. It is the opinion of Capt. Bolton, that the magnesinm will be cheaper than the oxy-calcium light, and equally powerful in its effects. On Tuesday night the light on shore was the oxy-calcium, while on board the *Great Eastern* the lime light was used. The lamp in the latter case not being so constructed as to keep out the wind effectually, there was some difficulty at first in getting a steady light, a delay which Shoeburyness noticed by signalling "Look sharp, look sharp; fire away!" An animated conversation between the ship and shore then took place, Shoeburyness finishing with "Good night, good night—our light nearly gone." The magnesium light has never been used by the Government for this purpose before Tuesday last, whereas the oxy-calcium light has been on trial for three years, so any conclusions as to the comparative merits of the two wonld be premature.—*London Examiner*, July 14.

The Speed of the Pen.

A rapid penman can write thirty words in a minute. To do this he must draw his quill through the space of one rod—sixteen and one half feet. In forty minutes his pen travels a furlong; and in five and one-third hours one mile.

We make, on an average, sixteen curves or turns of the pen in writing each word. Writing thirty words in a minute, we must make four hundred and eighty-eight to each second; in an hour, twenty-eight thousand eight hundred; in a day of only five hours, one hundred and forty-four thousand; in a year of three hundred days, forty-three million two hundred thousand.

The man who made one million strokes with a pen in a month was not at all remarkable. Many men make four millions.

Here we have in the aggregate a mark three hundred miles long, to be traced on paper by each writer in a year.

In making each letter of the ordinary alphabet, we must make from three to seven strokes of the pen—on an average of three and a half to four.—*Com. College Monthly.*

MARKET FOR THE MONTH.

	Price June 28.	Price Aug 2
Coal (Anth.) ℔ 2,000 lb.	$ 8 50 @10 00	$8 50
Coffee (Java) ℔ lb.	24 @ 25	25 @ 28
Copper (Am. Ingot) ℔ lb.	29 @ 30	30 @ 31
Cotton (middling) ℔ lb.	50	48
Flour (State) ℔ bbl.	$5 20 @ 6 15	$6 00 @ 7 00
Wheat ℔ bush.	1 70 @ 2 15	1 85 @ 2 30
Hay ℔ 100 lb	1 00	1 00
Hemp (Am. drs'd) ℔ tun.	260 00@270 00	255 00@265 00
Hides (city slaughter) ℔ lb.	7½@ 9	9 @ 10
India-rubber ℔ lb	47 @ 70	48 @ 70
Lead (Am.) ℔ 100 lb.	9 75 @10 00	9 00 @9 62½
Nails ℔ 100 lb	5 00 @ 5 25	6 50
Petroleum (crude) ℔ gal	35½	32½@ 33
Beef (mess) ℔ bbl.	$10 00 @16 00	10 00 @14 50
Saltpeter ℔ lb	24	24
Steel (Am. cast) ℔ lb.	13 @ 22	13 @ 22
Sugar (brown) ℔ lb	9½@ 15¼	8@ 16¼
Wool (American Saxony fleece) ℔ lb.	75 @ 77	75 @ 77
Zinc ℔ lb.	12 @ 12½	12¼@ 13¼
Gold	1 39	1 45⅜
Interest (loans on call	4 @ 5	7

OUR MERCANTILE MARINE.—It has been definitely ascertained that more than six hundred sea going vessels belonging to citizens of this country have been sold during the war to British subjects. Those sold to citizens of other countries will probably bring up the total to a thousand vessels that were four years ago carrying the stars and stripes and are now sailing under foreign colors. The capacity of the vessels transferred is estimated at five hundred thousand tuns.

HEAVY ENGINE.—The Taunton (Mass.) *Gazette* says one of the largest locomotives ever manufactured in that place was sent from the Taunton Locomotive Manufacturing Co. It weighs 34 tuns, and is destined to the New Jersey Central Railroad.

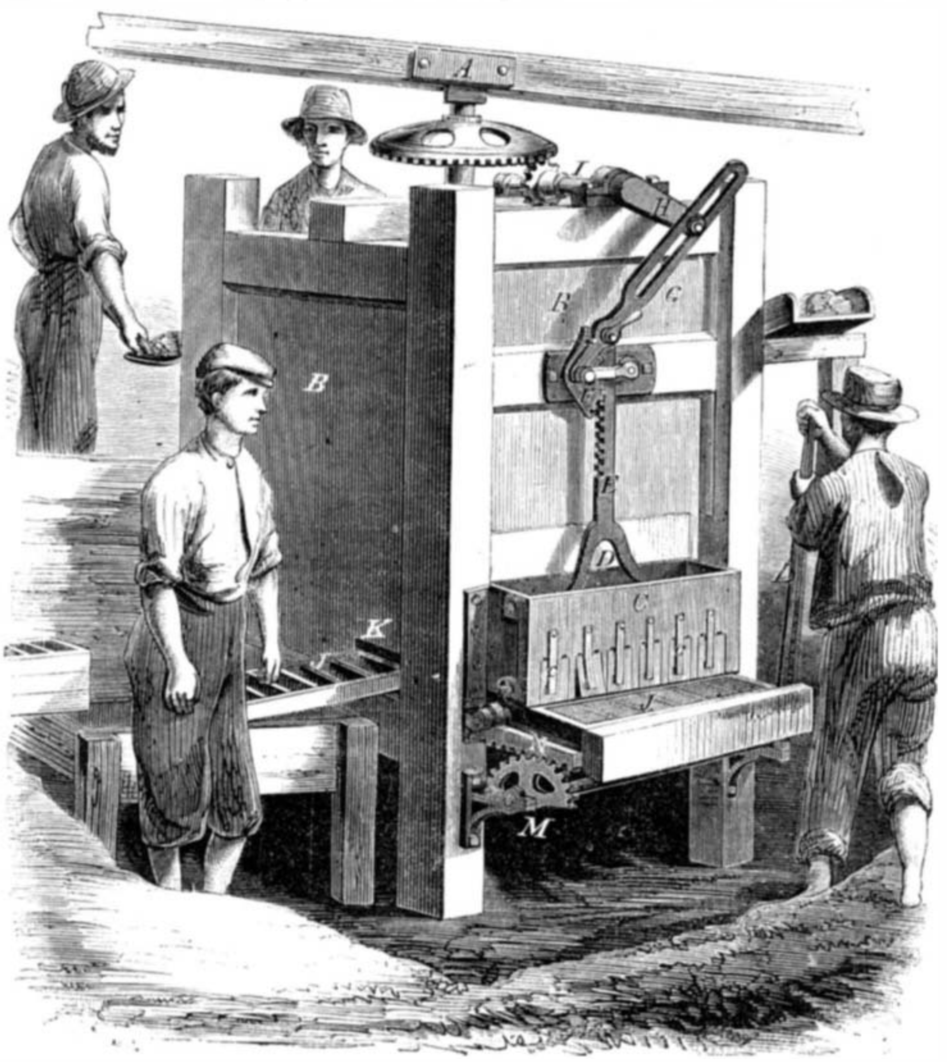
Improved Brick Machine.

The appended article is furnished by the inventor.

"The material advantages of this machine consists in the use of the lever principle, by means of which the power required to work the machine is considerably reduced, while the pressure is vastly increased. Thus clay may be worked with less moisture than otherwise, and the bricks still be perfectly smooth, square and solid. In this way they are handled with greater ease, are less liable to injury, while the process of drying is shortened, and damage from rains thereby avoided. It is claimed by the manufacturers that the machine may be made to produce fifty thousand bricks per day—the rate of production in nowise interferes with the quality; a fair day's work, they state, is from thirty to thirty-five thousand. To make this last-named amount, one strong horse, two men to produce the clay, one man to sand the molds, one man to strike, two men to remove the bricks and one man to dump, are required.

"The body or box, B B, has inside of it a vertical shaft, H, which is turned by a horse attached to the sweep, A. On thisshaft are knives to break up and mix the clay; also three forcing knives, six inches wide at the bottom, to push the clay into the molding box, C. In the molding box is a platen, D, worked by a rack, E, and toothed arc, F, which receive motion through a slotted arm, G, from a crank, H, on the horizontal shaft, I, which shaft is turned by the vertical shaft by means of bevel gearing, and makes about three turns to one turn of the vertical shaft. The molds, J J, are pushed in through the side, K, and are brought forward under the molding box by drawing forward the rack, N, by means of the toothed arc, M, on a shaft which is worked by the hand lever, L. When steam or water power is to be used, the inventor proposes, instead of the hand lever, to substitute gearing, by means of which the machine will bring forward the molds. As soon as the mold is brought under the molding box, the platen is forced down and presses the clay into the mold. During the downward movement of the platen, the slotted arm, G, gives such advantage of leverage to the crank, that the pressure is very strong; and during the upward movement of the crank the leverage is short, and the lift is quick. As soon as the platen is lifted, the mold is brought further forward into the fountain, J, in front of themolding box. During this forward movement of the molds, the bottom of the front of the molding box shoves off the clay level with the top of the mold, and thus forms the upper surfaces of the bricks. Lest stones or other foul substances in the clay, should be caught between the edge of the mold, and the edge of the molding box front, and cause breakage, there is a slide the under side of which is beveled so as to rise if any hard substance is forced against it. There is a slide or cam on the slotted lever, which regulates the press from one to six inches, and a nut with a handle to it, as shown in the engraving."

It was patented through the Scientific American Patent Agency, on the 27th June, 1865, by Henry Martin, and assigned to Bradford & Renick, 71 Broadway, New York, of whom further information may be obtained.



MARTIN'S "CHAMPION" BRICK MACHINE.

THE London *Atheneum* defines the meaning of the title F. R. S., as a man who Fairly Represents Science.

Hold on to the Running Board.

As the express train from Toronto was approaching Cornwall station, recently, the brakes were whistled down, the train backed up, and disappeared around the curve. After a delay of about ten minutes it came forward to the station. It was ascertained that the fireman had been out on the engine putting tallow in one of the cups. The train was running at full speed, and reaching the curve about a mile and a half west of the station unobserved by the fireman, the engine of course swerved as directed by the curve, causing the unfortunate man to fly off at a tangent. Singularly enough the result was not at all serious, for on the train returning to pick him up, he was found "marching on" to meet it.—*Cornwall* (C. W.) *Freeholder*.

A Choice Bit.

It seems there are some novelties recently discovered in the steam engine not generally known. We find the following lucid and astounding description in the New York *Herald*. It is about a new steam fire engine built at Manchester, N. H.:—

"It is the most powerful machine ever in use in this city, and considering the apparent scanty area of its motive power, it is in our view a marvel of beauty, symmetry and power. The boiler is only thirty-six inches in diameter and sixty-five inches in length, containing the almost incredible number of three hundred and thirteen copper tubes, twenty-four inches long and an inch and a quarter in diameter, thereby exposing a surface to caloric operation capable of generating a pressure of steam for instant work in about nine minutes. The pumps are two in number, of double action, and the steam cylinders, eight inches in diameter and twelve inches stroke, all working on the same piston rods, and all the fittings secured with the most durable mechanical skill, by which the harmony of motion at full work is as true to time as the most accomplished composer in the science of music could render his creations captivating in the highest degree. The materials used in the construction of this model of beauty in the steam engine are each and all of the choicest articles in their respective kind, such as the best boiler plate iron cased in wood and overlaid with Russia iron, hooped with bands of brass, a brass dome and funnel casing with india-rubber valves and polished mountings of turned brass and copper where such things are used. The various and numerous range of apparatus not actually in action with the machine itself when at work, are curious and pleasing in an eminent degree from their positive utility, such as the signal lantern, the wheels and brakes, the driver's seat and lamps, oil cans for the journals, self-supplied; signal whistle, a jackscrew, a coal bucket, capable of containing as much fuel as would work the engine for two hours at the highest pressure; a complete set of nozzles, of every bore and dimension, to provide against accident in the event of the one at work becoming deranged or disabled, and a hose one thousand feet long of the best tanned bullock hide, riveted in copper and capable of throwing, with great force, two, three or four jets of water at a time, a distance of upwards of two hundred and sixty feet from the nozzle. The second test was by taking the supply from an inexhaustible quantity in the river, and this being accomplished on the hydrant principle and from suction the results were most gratifying in every respect. It may now be averred with the utmost confidence, and without the remotest apprehension that anything rational can be said to the contrary that in this one production of scientific and mechanical skill the city of New York is in possession of the most powerful, the most complete, and for all the purposes for which it was designed and constructed in practical utilitarian and instant operation, a fire engine which stands as a model upon which all the world beside can fashion machines of kindred tendency, but the doubt is, can the combined skill of the whole world produce a better or suggest an improvement in the design and execution of the Metropolitan Fire engine of New York city?"

[We should say, no!—EDS.

STATISTICS.—A curious calculation has been made lately by a savant, well known in Paris for his peculiar antipathy to the fly. He collected three thousand flies in a room measuring two cubic meters; on the floor he spread a pounded loaf of sugar. At the end of four days he went in to investigate the result of his experiment. There remained a teaspoonful of sugar. This statistician therefore calculutes that, sugar being at the rate of thirteen cents a pound, a fly costs the country twenty cents from its birth to its demise.

[That is, if fed on loaf sugar.—EDS.

NEW COMBUSTIBLE.—I see the mention of a new combustible, invented by a gentleman who very appropriately bears the name of Stoker. It appears to be very pure charcoal, finely ground and made into a paste with starch. The paste is molded into cakes or balls of different sizes, and then dried. When perfectly dry these may be lighted with a lucifer match, and will continue to burn steadily, like German tinder, without giving flame or smoke. The combustible is intended for heating urns, chafferettes, etc.—*Paris Correspondent of Chemical News.*

A MODEL miniature locomotive, made of gold and silver, with a ruby for a head-light, and costing $4,000, is on exhibition at Taunton, Mass. Its wheels are driven by clock-work.