

PETROLEUM AS STEAM FUEL.

THE following is a letter written by G. B. N. Tower Esq., late Chief Engineer, U. S. Navy, with regard to experiments being made in the U. S. steamer *Palos*, with an apparatus invented by Col. Henry Foote, of Oil City, Pa., for burning petroleum. The results of the experiments seem to prove that the problem which has engaged attention so long has at last been solved, and that as a generator of steam, petroleum will take the place of coal, until by the increased demand for the former and the decreasing consumption of the latter, the prices of both commodities shall be more nearly equalized:

Boston, April 6th, 1867.

DEAR SIR,—Some weeks since you requested me to give you a statement of my connection with the use of Petroleum as fuel, and this being the first leisure moment I shall improve my opportunity to answer your request.

In 1862, on my return from sea, I met Chief Engineer Wood and Stimers, who had been ordered, together with Chief Engineer Whipple, to investigate the practicability and economy of Shaw & Linton's patent for burning petroleum under boilers, instead of coal. As they spoke highly of it, I examined it. The oil was made to flow through the axis of a truncated cone, corrugated horizontally, and running down the inclined surface, its progress was partially arrested by the circular basins, until it was consumed. This was a very crude affair, but a ratio of 2 to 1 in heating power, as compared with coal, was established. In 1863, while detailed as Chief Marine Engineer on Gen. Hatch's staff at Charleston, I had occasion to visit New York city. Some friends asked me to go with them and examine a new apparatus for burning petroleum. I found an ordinary grate, divided by a muffle, running from front to rear, and an ordinary light coal fire was burning, keeping the muffle hot. On letting on water and oil, by separate pipes, a sheet of flame, 4 or 50 feet long, issued from the muffle and passed through the flues, evolving great heat and generating steam quite rapidly. I immediately offered, in case they would furnish me with one muffle as a pattern, to build the others in the Government workshops at Charleston, S. C., and place them on board the Government transport, "De Kalb," being satisfied that it would increase her speed very materially. This was agreed to, but owing to some disputes among the shareholders, I went back to duty without having a pattern, and, of course, the matter dropped.

Early in 1866, I resigned my commission as Chief Engineer in the U. S. Navy, and came to Boston, and engaged in engineering pursuits. In November I was called upon to visit and examine an apparatus for burning petroleum, invented by Col. Henry L. Foote, and was so much struck by the simplicity of its arrangement, the ease with which it was managed, and the completeness of the combustion, that I spent nearly three hours in looking it over. I went several times afterwards, in company with other parties, to enjoy their surprise, and to examine it again. After some weeks, it was decided to apply to the U. S. Government to appoint a board to examine it, and I unhesitatingly wrote and signed a recommendation to the Secretary of the Navy. A board of Naval Engineers was ordered, they examined it, and their report was so favourable that orders were sent from the Bureau of Steam Engineering, placing at the disposal of Col. Foote the United States steamer "Palos," to be fitted with his invention. A certain amount of money was also appropriated by Government for the expenses and every facility in the way of tools, workshops and labour afforded him. While Col. Foote was superintending the construction of his apparatus, a series of experiments with coal were made on the "Palos" by order of the Government. In the first experiment, fire was lighted under one boiler only, and the coal was limited to 8 lbs. per square foot of grate surface; but after running the engines 50 minutes, the steam had fallen so low that the engines stopped, there being only 5 lbs. pressure in the boiler. It was then determined to use both boilers, with 8 lbs. of grate surface per hour, which was done, the experiment lasting for three days consecutively. Every pound of coal was weighed, and every ounce of water measured. The engines made 33 revolutions per minute, and steam was carried at 30 lbs. by throttling closely. The evaporation was very good, giving between 7 and 8 lbs. of water per pound of coal. After thoroughly cleaning the flues the 2nd experiment was commenced, and continued also for three days. There was no limit to the coal, but only 36 revolutions could be obtained from the engines and the evaporation only slightly increased, being about 8 lbs. of water per pound of coal.

On the 21st of March, Col. Foote's apparatus having been fitted to the "Palos," fire was lighted under one boiler; steam was rapidly generated, and the engine driven at 31 revolutions with thirty pounds of steam, for nearly three hours, when we extinguished the fire to make some needed changes. All felt well satisfied with the first trial, as it was not to be expected that the apparatus could be perfectly proportioned at the first, and it was assumed from the first that the fire would have to be lighted a few hours at a time, for several days before the apparatus could be pronounced to be perfectly adjusted. On Thursday, the 4th of April, the fire was lighted under both boilers, and, in 47 minutes from lighting the first fire, we had 30 lbs. of steam, and started the engines, and although the throttle was wide open, and the engines were making 30 revolutions, the steam increased, and we were obliged to shut off two of the fires, but the engine still kept up her revolutions, and the steam held steadily. On comparing the number of pounds of oil used, to the number of pounds of coal needed to produce the same effect, as ascertained by former ex-

periments, the ratio was found to be 1 lb. of oil to 8 of coal.

We are now daily making changes and lighting fires to see the effect of the alterations, and are at this moment burning less than half the oil, with the same effect as regards quantity of water evaporated.

I cannot conclude without thanking you for the zeal you have manifested in regard to these experiments. Many of the slight changes made were at your suggestion, and they have shown their great utility at once.

I presume we shall be associated together for some time yet, and it gives me much pleasure to have so able a coadjutor.

I am yours very truly,

G. B. N. TOWER,

La's Chief Engineer U. S. Army.

HENRY LESTER, Esq.,

American House, Boston, Mass.

ROYAL CANADIAN BANK—This institution has established an agency here which will be opened for the transaction of business on the 3rd of next month. The temporary office is in Mr. Calvin Brown's building, over Draper & Fingland's store. The Manager—Mr. J. Ambrose Goodman—is favourably known to the public as the former Cashier of the Bank of Upper Canada here. Mr. James Taylor is appointed Local Director, and Mr. Calvin Brown, Solicitor. Our business men will no doubt be glad of the increased accommodation offered by the opening of another Bank. —*St. Catharines Post.*

MONEY MARKET.

WE have no change to report in the money market. Sterling Exchange has been selling at 103½ to 104½ for 60-day Bank drafts, and 103 to 104 for private. In New York, best Bankers' bills sold yesterday at 103½ for gold. Gold drafts on New York are quoted at par to ¼ per cent. premium.

GOLD in New York under the influence of European advices, and the possibility of a general war there, which would induce the sending back of U. S. bonds, advanced to 137½ after numerous fluctuations, closing yesterday at 137½.

SILVER is more abundant, buying at 4 to 3½, and selling at 3½ per cent. discount.

THE GROCERY TRADE.

Anderson, John & Co.
Caldwell, T. H. & Co.
Chapman, Isaac & Tylee
Chapman H. & Co.
Childs, George & Co.
Davis, Clark & Clayton
Fitzpatrick & Moore
Fleming, John & Co.
Frank, J. C. & Co.
Gillispie, Moffatt & Co.
Jeffery, Brothers & Co.

Kings & Kinloch
Loring, Thomas & Co.
Mitchell, James
Phelan, Joseph
Robertson & Beattie
Robertson, David
Sinclair, Jack & Co.
Tiffin, Joe & Sons
Thompson, Murray & Co.
Torrance, David, & Co.
West, Alex.

Winn & Holland.

THE past week has been noticeable only for its dullness in this department of trade, owing to the causes which usually affect business at this season of the year, namely, bad roads, and the waiting for the opening of navigation.

COFFEE—Without change, and nothing doing.

FISH—Are without demand, the Lenten season being now almost over, and quotations are for the most part nominal.

FACIT—Stocks are in general not excessive, and although the inquiry is limited, prices are well maintained.

MOLASSES—Without change, transactions being chiefly of a retail character. Refinery syrups are unaltered.

RICE—Is scarce, and good samples are held at \$4.

SUGARS—Are without animation, but prices are fully maintained at \$7 50 to \$7 75 for Cuba, and \$7 75 to \$8 25 for Porto Rico.

TEAR—There is a fair jobbing demand. Good Twankans are very scarce, and none obtainable under 40c. Japans are, if anything lower, and low and medium grades are a little easier. In young Hysons there is a fair business doing, and the finer grades are firm, while for medium the demand is not very active.

THE DRY GOODS TRADE.

Bellie James & Co.
Baskin, Beck & Co.
J. Johnston, James & Co.
Black, Lewis & Co.
Clark, Jas. F. & Co.
Lambert, T. James & Co.
Davis, Welch & Co.
Egan, Scherer & Co.
Forsyth & Higgins
Gault, Bros & Co.
Gilmour, J. Y. & Co.
Greenhalgh, S. Son & Co.
Hingston, James & Co.
Lewis, Kay & Co.
Macfarlane, Andrew & Co.
MacKenzie, J. G. & Co.

MacKay, James, & Bro.
May, Joseph
Mar, Thomas & Co.
McIntyre, Denison & Co.
Moss, G. H. & J.
Muir, W. & R.
Mendenhall & Stearns
Ogden & Co.
Pimblett, Edwin & Co.
Robertson, A. & Co.
Roy, Jas. & Co.
Stephen, William & Co.
Stirling, McCall & Co.
Thomson, William & Co.
Winks, George & Co.

THE past week trade has been about an average for this season of the year, but perhaps hardly as active as at the corresponding period of last

year. A good many buyers are in town, mostly from the near-by districts, but they are not purchasing largely at present, some of them merely paying their notes, and stating that they will not buy until after the first of May, consequently a brisker business may be confidently looked for next month.

Imports continue to show a decline, amounting for this port for the present, as compared with last year up to this time, to nearly half a million of dollars. We hope this decrease in imports will go on for some time to come, as too many goods were brought out last year, leaving too large stocks on hand to be wintered over.

At present we believe that all departments are fairly supplied, with no special deficiency in any, and we think the season will close with moderately small stocks in the hands of importers.

In regard to prices, there is nothing particular to report. The Liverpool cotton markets have been weak, and the price has gradually receded, closing yesterday at 11½d to 11¾d for middling uplands and New Orleans. Manufactured goods have not yet felt the full influence of the decline in the raw material, and we do not look for any marked cheapening of staple articles in this market.

THE HARDWARE TRADE.

Brush, George
Charlebois, A. & Co.
Crathern & Caswell
Currie, W. & F. P., & Co.
Fane & Evans
Fleming, H. Henry
Frazier, F.
Gilbert, R. E.

Hall, Kar & Co.
Lea, W. H.
Kendrew & Edwards
Morland, Watson & Co.
Mullholland, & Baker
Robertson, Jas.
Round, John & Sons
Simms, F. H.
Waddell & Pearce

Winn & Holland

IN consequence of the general breaking up of the country roads, business in this as in other branches of trade is almost at a stand-still, and wholesale merchants report very little doing at present. As soon as navigation opens, however, and roads are fit for travel, a good deal of activity may be expected.

IRON—Stocks here are very low, and transactions, which have only been in retail lots, have been at full rates.

RAIL IRON—For present delivery prices are firm, while for May delivery some sales have been made at figures lower than our quotations.

BOILER PLATES—Are inactive, and prices, though nominally unaltered, could only be obtained for small lots.

TIN PLATES—Are in moderate supply, with no particular change to notice in rates.

CUT NAILS—Are inactive and without change.

BLACK TIE—The recent advance of £2 per ton in the English markets has slightly stiffened prices here, although we hear of exceptional lots having changed hands under our quotations.

THE LEATHER TRADE.

Hes & Richardson
Seymour, C. E.

Seymour, M. H.
Shaw P. & Bros.
Smith & Ed. & Son.

WE have no improvement to note in this branch of business, which continues very quiet, in sympathy with trade generally, but so far as we are able to ascertain there is no great probability of any excessive accumulation, to affect prices materially, even though trade should not become, on the opening of navigation, particularly active.

SPANISH SOLE—The bulk of the stock in market is of ordinary and low grades. Buenos Ayres being in unwanted limited supply.

SLAUGHTER SOLE—Is wholly neglected. Our quotations consequently cannot be taken as indicating the rates that could be realized.

HARNESS—Continues firm for prime stock which is very scarce, and obtainable only in a retail way, at fancy prices.

WAXED UPPER—Very little finds its way to market, but importations from the United States have satisfied the more immediate wants of the trade, and it is probable that a better supply will be coming forward within a few weeks.

HOFF AND FENNEL—The demand for strictly first class stock is fair—while inferior is more difficult to place, and is becoming more abundant.

PATENT AND ENAMELLED—Still in limited quantities at recent rates, with a moderate supply in market.

CALF SKIN—There has been rather more inquiry, but the receipts are very trifling, especially of choice stock.

SADDLES—Have been less active, the receipts being equal to the demand, particularly of heavy.

SHOE SKINS—There is more call for Light Russetts which are less plenty.

HIDES—Arrive only in limited quantities and are readily sold at 9½c to 10c for Green Easted.