

passing the shafts through the wheels on each side of the machine, and keying them into screws which are placed in a small hole excavated to receive them. The engine is then set to work, and the piles screwed down as far as possible. The cotters holding the crossbeam are then removed, and it is raised by the donkey engine pumping into the cylinder of the machine, and lifted off the piles. The machine is then moved forward to the centre line of the next pile, and the operation takes place as before.

Editorial Correspondence.

PUMPING ENGINES.

THERE have appeared in your valuable *Journal* quite a number of articles, within the past eighteen months, upon this important subject. It is one in which all our cities are especially interested, and its discussion can not fail to prove beneficial.

In the November number of your *Journal*, was an article over the signature of W. M. Henderson, hydraulic engineer, which shows an extended knowledge of the subject.

Like him I have been looking for some further information about that "other engine based upon reciprocating parts, without a fly-wheel which possessed the capacity of rivalling the Cornish in its best results, without the requirements of magnitude demanded by that engine."

From the remarks of Mr. Henderson, in regard to this "other engine"—it appears that it is now being built for the new water works in West Philadelphia—and most of us have heard of this engine under the name of the "Worthington Duplex."

Very many of these, of moderate size, are in operation throughout the country, and generally, I believe, working with little noise, and little repairs, and with great satisfaction to the owners.

If to their satisfactory operation, as to repair and general efficiency, the authorities of our great cities could be informed *with certainty* as to their economy in fuel—as to the "*duty*" they perform when compared with the cornish, many of the city fathers would be greatly relieved. For who does not know the deep anxiety of these gentlemen, in all the great municipalities of the land, to economize *in machinery*, that the load of taxes on the people may be light.

When that West Philadelphia engine then shall be completed,

it may be expected that a vigorous test of their performance shall be made; and the duty performed, everywhere reported. This can not fail to be done, as these rather insignificant looking machines have so much pretension; and even aspire to rank with the Cornish in economy of result.

But while we are patiently waiting the completion and test of these engines, it would give great satisfaction to many of your readers if the duty of the *Cornish Engines in this Country*, or even in Philadelphia, could be given in your columns.

Those reported by Mr. Henderson as a basis of comparison in the coming trial of the Duplex are too distant for a satisfactory comparison—other fuel is used, other kinds of boilers, probably—and, perhaps, a different rule of computation.

Cannot some of your contributors furnish the result of the Cornish engines here in Philadelphia for such a comparison. Cannot Mr. Henderson supply them?

As giving some information, perhaps, now forgotten, that was published a few years since, when the subject of the pumping engines for the City of Brooklyn was under discussion, I copy the results of comparative tests carefully made at that time under the direction of experts.

		Pounds Raised One Foot High.	
		By one lb. of Coal.	By 112 lbs. of Coal
			MILLIONS.
Brooklyn Engine,	Double acting Beam Engine no fly wheel,	601,407	67-36
Belleville “	Cornish,	628,233	70-36
Hartford “	Crank,	587,793	65-83
“ “	“ 2d trial,	614,426	68-82
“ “	“ 3d trial,	646,994	72-46
Cambridge “	Worthington, 1st trial, .	669,411	74-97
“ “	“ 2d trial,	675,746	75-68
Sp. Garden, Phila.	Cornish,	589,053	65-97

Taking the average of the two trials of the Cambridge engine at.....75 Millions.

And the average of the Belleville and Spring Garden Cornish

engines at.....68 “

Gives an excess of duty to the former of.....7 “

If, as is claimed by the advocates of the Worthington engines, a better result can be realized with engines of larger size than that at Cambridge, this class of engines may become a formidable rival even of the *Cornish*, which has so long maintained and so well deserved its pre-eminence.

FULTON.