We have to regret in this case, as with most of our sea steamers, the absence of indicator diagrams, by which only, can we arrive at correct conclusions as to the efficiency of the engines, boilers, &c.

For a full detail of all the dimensions of the *St. Louis*, see *Franklin Institute Journal*, page 353, VOL. XXVII.

For the Journal of the Franklin Institute.

Trial Trip of the Steamer John K. Hammit. By WASHINGTON JONES.

This steamer, built for the Laguayra and Porto Cabello Steam Packet Company, (the particulars of engine and hull will be found in the *Journal of the Franklin Institute*, Vol. xxvii, page 282. The estimated number of turns is there stated to be 26. It should have been 36,) went on the engineer's trial trip, October 21st. The following is an account of her performance and condition at the time :

KETCH RIGGED.—

Draft forward,	,	7 feet.
“ aft,		8 “ 6 in.
“ mean,		7 “ 9 “
Amidship section immersed,		140 sq. ft.

The time of passing the measured distances, pressure of steam, vacuum, and number of revolutions, was carefully noted, and will be found in the subjoined table. The boiler furnishes an ample supply of steam with natural draft, burning bituminous coal.

Time down.	Place.	Pressure of Steam in pounds per gauge.	Vacuum in inches per gauge.	Revolutions of engine.
A. M. 10-31	Navy Yard Shears,	30	26	40½
“ 10-46	Powder Piers,	30	26	41½
“ 11-22½	Fort,	28	26	41
P. M. 12-21	Chester,	21	26	38

The vessel was rounded to, passing below the bar of Chester island, and headed for the return to the City through the west channel.

Time up.	Place.	Pressure of Steam.	Vacuum.	Revolutions.
P. M. 12-41	Chester,	30	26	42
“ 1-24	Fort,	26	26	40½
“ 1-42	Powder Pier,	29	26	41
“ 2-2	Navy Yard Shears,	30	26	43

The measured distance run to Chester from Navy Yard Shears and back, is thirty miles, to which must be added the opposing current of a strong flood tide, during the run down, and a reduction made for its assistance in returning from Chester to the Fort; the remaining distance was run in nearly slack water. No change was observed in the wind, which blew tolerably strong, and was in favor down, but in opposition

up; the two effects may be considered as neutralizing each other, and be disregarded.

Distance from Navy Yard Shears to Chester,	15 miles.
Add for current of $2\frac{1}{4}$ miles per hour, acting for one hour and fifty minutes,	4.6 "
Distance back to Navy Yard Shears,	15 miles.
Deduct for current of latter part of flood tide, .75 mile per hour during 43 minutes time,	.54 "
	<hr/> 14.46 "
Actual distance through the water,	<hr/> = 34.06 "
Time occupied in running to Chester from Navy Yard Shears,	1 hour 50 min.
" " " from " to " " "	1 " 21 "
	<hr/> 3 " 11 "

By dividing is found the average speed of the vessel through the water = 10.7 miles per hour, or 941.6 feet per minute.

The pitch of the propeller at centre of pressure is, 14.71 feet, and it completes two revolutions for one of the engine. By averaging the turns made by the engine, we get for the theoretical progression of the propeller per minute,

$$\begin{array}{rcl} \text{Progression of vessel,} & 41\frac{1}{2} \times 2 \times 14.71 = & 1209.9 \text{ feet.} \\ & & \underline{941.6 \text{ "}} \\ \text{Slip,} & & 268.3 \text{ "} \end{array}$$

or over 22 per cent.

It is expected, that the per centage of slip will be reduced when the vessel is brought to trim more by the head, which will make the angle of the entrance finer. The model of the hull is good; and from the known reputation of the builders, Messrs. J. K. Hammit & Son, has had justice done it in the construction. Not being designed for great speed, the route being short, but a comparatively small amount of engine power was placed in her; so the result of the trial was very satisfactory to contractor as well as builders. She will sail for her destination, to be placed upon her intended route, about the last of October.

For the Journal of the Franklin Institute.

Notes on the Cloud Combination of Steam and Air. By WM. H. SHOCK,
Chf. Eng., U. S. Navy.

By invitation, I lately visited an establishment in New York, where they have a small engine for driving three of "Hoe's Patent Printing Presses," and in which they use the *Cloud Combination of Steam and Air*.

I here submit the facts, collected during my visit, (with two reports made by Horatio Allen, Esq., of New York, annexed,) hoping they will prove an incentive to a further examination of the principles of this phenomena in steam engineering.

The engine used for driving the above presses, is of that class known