and a subsequent corresponding effort to regain its natural position, by which the composition of the metal was disturbed, and fracture ensued.

Other examples of the same nature were given, and it was shown that the repeated buckling of the tube-plate of a locomotive, arising from the action of the pistons, had a tendency to cause fracture mechanically; and also that the side-strains and vibrations to which suspension-rods of the ash-pans of locomotives were subjected, had produced very serious results, which it sufficed to point out forcibly to guard against the recurrence of.

The author contended, that presuming adequate dimensions to have been given to girders, and the stipulated weight not to have been exceeded, the chances of accident were remote, but that any repeated deflexion, either at intervals, or continued for so long as to induce a permanent depression, must be productive of danger, which could only be averted by altering or replacing the parts deficient in strength, and maintaining a rigid supervision, whether of beams when loaded, or of parts of machinery, or of railway stock after working. By such means accidents would be prevented, and a greater degree of confidence be established in structures in which metal was employed.

For the Journal of the Franklin Institute.

Abstract from the Steam Log of the "Baltic," Collins' Steamer, from Liverpool, July 8th, 1854. By WM. H. SHOCK, Chief Eng. U. S. N.

To the kindness of Chief Engineer, R. Robinson, of the "*Baltic*," I am indebted for, (and by which I am enabled to lay before the readers of the *Journal*,) an abstract of the steam log of that ship, during her late and remarkably quick run from Liverpool to New York. It will be seen, that she left Liverpool on Thursday, June 29th, and arrived in New York, July 8th, having accomplished the run in the unprecedented time of *nine days, sixteen hours, and fifty-three minutes*.

The "*Baltic*" has just been furnished with two new cylinders, of the same dimensions as those removed, viz. 95 inches diameter, 10 feet stroke, and this was the first voyage made with them, as well as with the new composition tubes recently fitted in her boilers. I do not find any *marked* improvement in the efficiency of the boilers, resulting from the adoption of the composition tubes; as I find as good an average of steam given her, with about the same consumption of coal, on previous voyages; the cause of this I attribute entirely to the loss sustained by reflection, in consequence of the smooth and bright surface of the tubes, which a few trips will suffice to remedy.

The diagrams are the *originals*, taken during the voyage, and consequently have not been submitted to the possibility of an error, by copying. Nos. 1 and 2, were taken at 10 A. M., June 29th, (on the first day out from Liverpool,) steam by gauge $17\frac{1}{2}$ lbs., revolutions 13·8 per minute. Nos. 3 and 4, were taken at 10 A. M., July 7th, (on the day previous to her arrival in New York,) steam per gauge $17\frac{1}{2}$ lbs., revolutions 16·7 per minute. Nos. 1 and 3, were taken from the *bottoms* of port and starboard cylinders, respectively. Nos. 2 and 4, from the *tops* of port and starboard cylinders, in the same order.

No. 3 diagram, it will be observed, shows a slight excess of pressure in the cylinder over that indicated by the gauge, an error which I presume occurred in noting the pressure from the gauge. The same diagram

shows also a defective steam line, resulting, no doubt, from obstructions in the pipe, leading from the bottom of the cylinder to a point convenient for attaching the instrument near the top.

Abstract of Log of Steamship Baltic.

Month.	Day.	Date	Ave. Steam.	Ave. Rev.	Total rev.	Time.	Coal	Knots run.	Latitude.	Longitude.
1854			lbs.			Ho'rs.				
June,	Thursday,	29	16	13.1	18,935	23	Average coal, 95 tons per 24 hours.	294	55° 30'	9° 48'
"	Friday,	30	17½	13.9	20,468	24		318	55 05	19 08
July,	Saturday,	1	17½	14.4	21,172	24		326	53 45	28 03
"	Sunday,	2	18	14.9	22,056	24		325	52 44	36 40
"	Monday,	3	18	15.4	22,739	24		327	50 56	44 06
"	Tuesday,	4	17½	15.4	22,696	24		324	48 00	51 04
"	Wednesday	5	17½	16	23,381	24		322	45 20	58 00
"	Thursday,	6	17	16.3	24,007	24		319	42 50	63 45
"	Friday,	7	17½	16.6	24,412	24		332	40 45	70 40
"	Saturday,	8	16	16.4	13,220	13		160	miles to	dock.

Duration of passage, 9 days 16 hours and 53 minutes.