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A treatise on the steam-engine

Russell, John Scott

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Statistical tables of the evaporation and combustion of steam boilers.

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STATISTICAL TABLES

OF THE

EVAPORATION AND COMBUSTION OF STEAM BOILERS.

No. of experiment.	Place of experiment.	Nature of coals used.	PARTICULARS OF THE BOILERS.											PARTICULARS OF THE COMBUSTION.				PARTICULARS OF THE EVAPORATION FROM THE INITIAL TEMPERATURE OF THE WATER.							PARTICULARS OF THE EVAPORATION OF WATER AT THE TEMPERATURE OF 112°.							PARTICULARS OF THE PROPORTIONS OF HEATED SURFACE TO FUEL BURNED AND WATER EVAPORATED.						
			Form of the boilers.	No. of boilers in use.	Length.	Breadth.	Diameter.	Total area of heated surface.	Surface exposed to radiant heat.	Surface exposed to communicative heat.	Length of circuit made by the heat in one boiler.	Area of the grates.	Weight burnt per square foot of grate per hour.	Weight burnt per square foot of heated surface per hour.	Temperature of the water entering the boilers.	Pressure of the steam above the atmosphere.	Cubic feet evaporated per hour.	Pounds evaporated per lb. of fuel.	Pounds of fuel evaporating one cubic foot of water.	Pounds of water evaporated by the products of combustion per square foot of grate per hour.	Pounds of water evaporated per square foot of heated surface per hour.	Pounds evaporated by 1 lb. of fuel.	Pounds of fuel evaporating one cubic foot of water.	Pounds of water evaporated by the products of combustion per square foot of grate per hour.	Pounds of water evaporated per square foot of heated surface per hour.	Square feet of heated surface to one square foot of grate.	Square feet of heated surface per lb. of fuel burnt per hour.	Square feet of heated surface per lb. of water evaporated per hour from its initial temperature.	Square feet of heated surface per lb. of water evaporated per hour from 212°.	Square feet of heated surface per cubic foot of water evaporated per hour from its initial temperature.	Square feet of heated surface per cubic foot of water evaporated per hour from 212°.							
																																ft.	ft.	ft. in.	sq. ft.	sq. ft.	sq. ft.	ft.
I.	Huel Towan	*W.	Cyl.	3	36	..	6 0	2600	114	2486	152.	72.0	2.83	0.078	93.8	49.4	34.82	10.58	5.90	25.94	0.829	11.89	5.25	33.66	0.932	35.11	12.75	1.205	1.072	74.67	67.04							
II.	United Mines	W.	Cyl.	3	2, { 36 1, { 40	..	6 4	3170	98	3072	158.	70.0	4.09	0.093	96.0	35.0	48.04	10.48	5.95	42.90	0.977	11.76	5.31	48.13	1.096	43.88	10.72	1.922	0.911	63.94	56.58							
III.	Mean of exp. I. & II.	W.	Cyl.	3	36.66	..	6 2	2885	106	2779	155.	71.0	3.45	0.085	94.9	42.2	41.43	10.53	5.92	36.42	0.903	11.82	5.28	40.89	1.014	39.99	11.73	1.113	0.991	69.30	62.01							
IV.	East Crinnis	W.	Cyl.	3	2, { 34 1, { 36	..	2, { 6 9 1, { 7 0	2500	57	2443	152.33	37.5	7.00	0.104	..	..	..	..	..	..	..	..	..	..	..	66.66	9.52	..	..	..	..			
V.	Binner Downs	W.	Cyl.	2	30	..	6 0	1440	76	1364	132.	48.0	4.62	0.154	..	..	..	..	..	..	..	..	..	..	..	30.00	..	..	..	..				
V.	Warwick	S.	Wag.	3	1, { 15.0 2, { 12.5	1, { 6.0 2, { 5.0	..	455.0	107.0	338.0	50 66	70.5	4.00	0.019	93.0	2.5	41.38	9.17	6.81	36.68	5.684	10.32	6.05	41.28	6.396	6.45	1.61	0.1705	0.1565	10.99	9.77							
VI.	Clithero	L.	Wag.	1	20.0	5.5	..	320.0	23.62	296.38	91.0	17.6	11.53	0.634	44.0	5.0	18.55	5.71	10.94	63.90	3.625	6.73	9.27	77.69	4.273	18.18	1.57	1.27	0.234	17.25	14.63							
VII.	Ditto	L.	Wag.	1	20.0	5.5	..	320.0	35.43	284.56	91.0	20.25	8.02	0.507	44.0	5.0	21.62	8.32	7.51	63.75	4.224	9.79	6.78	78.55	4.970	15.80	1.97	0.35	1.201	14.80	12.57							
VIII.	Preston	L.	Wag.	1	13.5	8.0	..	297.0	46.85	250.15	70.0	27.75	9.97	0.931	76.0	4.0	33.17	7.49	8.33	74.74	6.984	8.56	7.28	85.44	8.000	10.70	1.07	0.143	0.114	9.00	7.8							
IX.	Ditto	L.	Wag.	1	13.5	8.0	..	297.0	46.85	250.15	70.0	27.75	9.27	0.867	80.0	4.0	35.00	8.49	7.36	78.82	7.360	9.67	6.46	89.77	8.388	10.70	1.15	0.135	0.119	8.78	7.45							
X.	Ditto	L.	Wag.	1	13.5	8.0	..	297.0	46.85	250.15	70.0	27.75	11.88	1.110	74.0	4.0	44.25	8.38	7.45	99.65	9.311	9.60	6.50	114.13	10.603	10.70	0.9 0	0.107	0.093	6.71	5.86							
XI.	Albion Mills	N.	Wag.	1	16.0	6.0	..	521.5	35.0	486.5	70.0	24.5	16.44	0.772	100.25	2.5	55.60	8.62	7.24	141.83	6.663	9.63	6.48	158.55	7.448	21.28	1.254	0.150	0.134	9.28	8.59							
XII.	London	N.	Wag.	2	15.0	5.5	..	345.0	31.5	313.5	56.0	22.66	12.79	0.840	101.50	2.5	32.52	7.00	8.91	89.71	5.891	7.82	8.00	100.14	6.577	15.22	1.189	0.169	0.152	10.60	9.00							
XIII.	Ditto	N.	Wag.	2	15.0	5.5	..	345.0	52.5	292.5	56.0	40.50	6.17	0.725	96.70	2.5	34.53	8.1	7.70	53.98	6.254	9.09	6.87	59.75	7.015	8.51	1.379	0.159	0.142	10.00	8.91							
XIII.	Mean of exp. VI.—XIV.	L.	Wag.	1	36.66	6.5	..	342.81	39.82	302.98	72.5	26.09	10.75	0.798	77.0	3.68	34.40	7.76	8.18	83.83	6.289	8.86	7.15	95.50	7.166	13.88	1.315	0.171	0.149	10.77	9.89							
XIV.	Long Benton ..	N.	Circ.	2	..	..	1, { 12 1, { 13 6	459.0	71.0	388.0	52.8	35.10	20.34	1.55	152.0	1.5	90.00	7.87	7.93	160.25	12.250	8.37	7.46	170.36	13.02	13.08	0.642	0.0816	0.0767	5.10	4.79					
XV.	Manchester & Liverpool Railway	Coals Coke	Loc.	1	7.0	..	..	334.56	41.47	293.11	7.0	7.03	79.33	1.66	60.0	50.0	55.48	6.21	10.05	493.27	10.300	7.21	8.66	573.25	12.04	47.59	0.581	0.096	0.080	6.02	5.03					
XVI.	Killingworth	Coals Coke	Loc.	1	10.0	..	..	124.06	22.56	101.5	..	12.90	45.49	4.73	60.0	..	41.92	4.46	14.00	203.10	21.118	5.17	12.07	235.50	24.48	9.61	0.211	0.047	0.040	2.95	2.55					
	1		2	3	4			5	6	7			8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		

* W. indicates Welsh; S. Staffordshire; N. Newcastle; L. Lancashire.