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Ref.	Pub.	Date	Author	Title
1	S	24 1905*	Burgess, G.K.	Radiation from platinum at high temperatures, 5c. B. of S. Bull. Vol. 1.
2	S	38 1906*	Guthe, K.E., Austin, L.W.	Experiments on the Heusler magnetic alloys, 10p. B. of S. Bull. Vol. 2.
3	S	78 1907	Burrows, C.W.	The best method of deragnetizing iron in magnetic testing, 15p. B. of S. Bull. Vol. 4.
4	S	55 1907*	Waidner, C.W., Burgess, G.K.	Radiation from and melting point of palladium and platinum, 10p. B. of S. Bull. Vol. 4.
5	S	62 1907*	Burgess, G.K.	Melting points of the iron-group elements by a new radiation method, 10p. B. of S. Bull. Vol. 4.
6	S	99 1908	Burgess, G.K.	Methods of obtaining cooling curves, 10p. B. of S. Bull. Vol. 5.
7	S	109 1909	Lloyd, M.G., Fisher, J.U.S.	The testing of transformer steel, 5p. B. of S. Bull. Vol. 5.
8	S	121 1909*	Burgess, G.K.	The estimation of the temperature of copper by means of optical pyrometers, 5p. B. of S. Bull. Vol. 6.
9	S	124 1909	Waidner, C.W., Burgess, G.K.	Platinum resistance thermometry in high temperatures, 10p. B. of S. Bull. Vol. 6.
10	S	161 1911	Cain, J.R.	The determination of vanadium and chrome-vanadium steels, 5p. B. of S. Bull. Vol. 7.
11	T	6 1911	Cain, J.R.	The determination of chromium and its separation from vanadium in steels, 5p.
12	T	8 1911*	Cain, J.R., Hostetter, J.C.	A rapid method for the determination of vanadium in steels, ores, etc., based on its quantitative inclusion by the phosphomolybdate precipitate, 5p.

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13	T 11	1912*	Devries, R.P.	Comparison of five methods used to measure hardness, 5¢.
14	S 198	1913	Burgess, G.K.	A micropyrometer, 5¢. B. of S. Bull. Vol. 9.
15	T 24	1913	Cain, J.R., Tucker, F.H.	The determination of phosphorus in steels containing vanadium, 5¢.
16	T 33	1913*	Cain, J.R.	Determination of carbon in steel and iron by the barium carbonate titration method, 5¢.
17	S 205	1914	Burgess, G.K., Waltenberg, R.G.	Melting points of the refractory elements, I. Elements of atomic weight from 48 to 59, 5¢. B. of S. Bull. Vol. 10.
18	S 222	1914	Burgess, G.K., Foote, P.D.	The emissivity of metals and oxides. I. Nickel oxide (NiO) in the ranges of 600 to 1300°C. 10¢. B. of S. Bull. Vol. 10.
19	S 242	1914	Burgess, G.K., Waltenberg, R.G.	The emissivity of metals and oxides. II. Measurements with the micropyrometer, 5¢. B. of S. Bull. Vol. 10.
20	T 38	1914	Crowe, J.J., Rawdon, H.S., Waltenberg, R.G.	Observations on finishing temperature and properties of rail, 35¢.
21	C 31	1914		Copper wire tables, 20¢.
22		1914		Progress in the nomenclature of alloys. Trans. Am. Inst. Met. VIII, p. 96.
23	S 243	1915*	Foote, P.D.	The emissivity of metals and oxides. III. The total emissivity of platinum and the relation between total emissivity and resistivity, 5¢. B. of S. Bull. Vol. 12.
24	S 249	1915*	Burgess, G.K., Foote, P.D.	The emissivity of metals and oxides. IV. Iron oxide, 5¢. B. of S. Bull. Vol. 12.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
25	S 250	1915	Burgess, G.K., Footc, P.D.	Characteristics of radiation pyrometers, 20¢. B. of S. Bull. Vol. 12.
26	S 236	1915	Burgess, G.K., Kellberg, I.N.	Electrical resistance and crit- ical ranges of pure iron, 5¢. B. of S. Bull. Vol. 11.
27		1915	Burgess, G.K., Hadfield, R.A.	Sound ingots and rails, Trans. Am. Inst. Min. Eng., 51, p.862; Proc. Iron & Steel Inst. of Great Britain 92, No.2, p. 199.
28		1915	Burgess, G.K., Sale, P.D.	A study of the quality of platinum ware, 10¢. B. of S. Bull. Vol. 12.
29		1915	Burgess, G.K., Kellberg, I.N.	On a supposed allotropy of copper, J. Wash. Acad. 5, p.657.
30	T 53	1915	Burgess, G.K., Merica, P.D.	An investigation of fusible tin boiler plugs, 20¢. Trans. Am. Inst. Metals, 1915-21.
31		1915	Merica, P.D., Woodward, R.W.	Failure of structural brass, Trans. Am. Inst. Metals, p. 298.
32		1915	Haneman, H., Merica, P.D.	Magnetic studies of mechanical deformation in certain ferro- magnetic metals and alloys, Bull. Am. Inst. Chem. Eng., p. 2371.
33	S 266	1916	Cain, J.R., Schram, E., Cleaves, H.E.	Preparation of pure iron and iron-carbon alloys, 10¢. B. of S. Bull. Vol. 13.
34	S 69	1916*	Cain, J.R., Cleaves, H.E.	Determination of carbon in steels and iron by direct combustion in oxygen at high temperatures, Jour. Wash. Acad. Sci., 4, p. 393.
35		1916		A test of a surface combus- tion furnace, Jour. Ind. & Eng. Chem., 8, p. 361.
36		1916	Rawdon, H.S., Cain, J.R.	Report on ladle-test steel ingots, Proc. A.S.T.M., Vol. 16, p. 129.

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37	T 60	1916*	Rawdon, H. S.	Microstructural changes accompanying the annealing of cast bronze, 10¢.
38		1916	Rawdon, H. S.	Note on the occurrence and significance of twinned crystals in electrolytic copper, Am. Inst. Met., Vol. 10, pp. 198-207.
39		1916	Burgess, G. K.	Thermometry, pyrometry and heat conductivity, Standard Handbook for Electric Engrs.
40		1916	Burgess, G. K.	Some problems in physical metallurgy at the Bureau of Standards, Jour. Frank. Inst. 183, p. 19.
41	S 280	1916	Burgess, G. K., Waltenberg, R. G.	Further experiments on the volatilization of platinum, 5¢.
42	T 61	1916	Burgess, G. K., Merica, P. D.	Some foreign specifications for railway materials; rails, wheels, axles, tires, 25¢.
43	S 272	1916	Burrows, C. W.	Correlation of the magnetic and mechanical properties of steel, 13¢. B. of S. Bull. Vol. 13.
44	T 59	1916	Karr, C. P., Rawdon, H. S.	Standard test specimen of zinc bronze (88Cu-10Sn-2Zn) 25¢.
45	T 83	1916	Merica, P. D.	Failure of brass: II. Effect of corrosion on ductility and strength of brass, 5¢.
46	T 84	1916	Merica, P. D., Karr, C. P.	Failure of brass. III. Initial stresses produced by the "burning in" of manganese bronze, 5¢.
47		1916		Preliminary report on testing of molding sand, Trans. Am. Foundrymens Assoc. 24, p. 143.

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48	T 82	1917*	Merica, P.D., Woodward, R.W.	Failure of brass. I. Micro-structure and initial stress in wrought brass of the type 60 per cent copper and 40 per cent zinc, 25¢.
49	T 90	1917*	Merica, P.D.	Structure of coating on tinned sheet copper in relation to a specific case of corrosion, 5¢.
50		1917	Merica, P.D.	The embrittling action of sodium hydroxide on mild steel, Chem. Met. Eng., 16, p. 496.
51	C 66	1917		Standard samples of thermometric fixed points, 5¢.
52	T 91	1917	Burgess, G.K.	Temperature measurements in Bessemer and open-hearth practice, 5¢.
53		1917	Woodward, R.W., Hanison, T.R.	Notes on the thermocouple nichrome constantan, Chem. Met. Eng., 16, p. 647.
54	T 97	1918	Rawdon, H.S.	Some unusual features in the microstructure of wrought iron, Tr. A.I.M.M.E., 58, p. 493.
55	T 103	1918*	Rawdon, H.S.	Typical cases of the deterioration of Muntz metal by selective corrosion, Am. Inst. Metals, 11, 12, p. 148.
56		1918		Copper, Chem. Met. Eng., 18, p. 121, 192, 303, 357.
57	C 76	1918	Merica, P.D.	Aluminum and its light alloys, 20¢. Chem. Met. Eng., 19, p. 135, 200, 329, 587, 635. (C 76 now superseded by C 346, \$1.10).
58	C 67	1918.		Combined tables of sizes in the principal wire gages, 5¢.
59		1919	Cain, J.R., Rawdon, H.S.	Report of ladle-test ingot investigation, Appendix of Report of Com. A-1, A.S.T.M., 19, (1), p. 154.

Ref.	Pub.	Date	Author	Title
60	S 350	1919	Cain, J.R.	Equilibrium conditions in the system carbon, iron oxide, and hydrogen in relation to the Ledebur method for determining oxygen in steel, 5p. B. of S. Bull. Vol. 15.
61		1919	Cain, J.R., Maxwell, L.C.	Rapid determination of carbon in steel by the barium-carbonate titration method, Jnl. Ind. & Eng. Chem., 10, p. 520.
62	T 118	1919*	Cain, J.R., Pettijohn, E.	A critical study of the Ledebur method for determining oxygen in iron and steel, 5p.
63	T 126	1919	Cain, J.R., Pettijohn, E.	Study of the Goutal method of determining carbon-monoxide and carbon-dioxide in steels, 5p.
64	T 141	1919	Cain, J.R., Maxwell, L.C.	Electrolytic resistance method for determining carbon in steel, 5p. Jour. Ind. & Eng. Chem., 11, p. 852.
65	S 346	1919	Cain, J.R., Pettijohn, E.	Oxygen content by the Ledebur method of acid Bessemer steels deoxidized in various ways, 5p. B. of S. Bull. Vol. 15.
66		1919	Cain, J.R.	Determining gases in steel and the deoxidation of steel, A.I.M.M.E. Bull. 152, p. 1309. Tr. A.I.M.M.E. 62, p. 209 (1920).
67	C 80	1919	Rawdon, H.S., Finn, A.N., Grossman, M.A.	Protective metallic coatings for the rust-proofing of iron and steel, 20p. (revised 1922) Chem. Met. Eng., 20, p. 458, 530, 591.
68		1919	Rawdon, H.S.	Applications of metal radiography Yearbook, Am. Iron & Steel Inst., p. 369.
69		1919	Rawdon, H.S.	Microstructure of flaky steel, Bull. A.I.M.M.E. No. 146, p. 183-201, 792, 804, 969-70; Trans. A.I.M.M.E. 62, p. 246 (1920).

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
70	S 337	1919	Merica, P.D., Waltenberg, R.G., Freeman, J.R. jr.	Constitution and metallography of aluminum and its light alloys with copper and magnesium, 10¢. Vol. 15, B. of S. Bull. Bull. A.I.M.E. 151, p. 1001
71	S 347	1919	Merica, P.D., Waltenberg, R.G., Scott, H.	Heat treatment of duralumin, 10¢. Bull. A.I.M.E. 150, p. 913, B. of S. Bull. Vol. 15.
72	S 336	1919	Merica, P.D.	A simplification of the involution rate method for thermal analysis, 5¢. Bull. A.I.M.E. 151, 1021; B. of S. Bull. Vol. 15.
73	T 129	1919	Merica, P.D., Guervich, L.J.	Notes on graphitization of white cast iron upon annealing, 5¢. Bull. A.I.M.E. 151, p. 1033; Tr. A.I.M.E. 62, p. 509.
74	T 132	1919	Merica, P.D., Waltenberg, R.G., Finn, A.N.	Mechanical properties and resistance to corrosion of rolled light alloys of aluminum and magnesium with copper, nickel and manganese, 5¢. Bull. A.I.M.E. 151, p. 1051.
75	T 139	1919	Merica, P.D., Karr, C.P.	Some tests of light aluminum casting alloys. The effect of heat treatment, A.S.T.M., 19, (2), p. 298.
76	T 135	1919	Merica, P.D., Woodward, R.W.	Behavior of wrought manganese bronze exposed to corrosion while under tensile stress, 5¢. Proc. A.S.T.M., 19 (2), p. 279.
77	S 335	1919	Scott, H.	Effect of rate of temperature change on the transformations in an alloy steel, 5¢. B. of S. Bull. Vol. 15; Bull. A.I.M.E. 146, p. 157; Tr. A.I.M.E. 62, p. 689 (1920).
78	S 348	1919	Scott, H., Freeman, J.R. jr.	Use of a modified Rosenhain furnace for thermal analysis, 5¢. B. of S. Bull. Vol. 15, Bull. A.I.M.E., 152, p. 1429.
79	LC111	1919		Characteristics, treatment and uses of high-speed tool steel.

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80		1919	Waidner, C.W., Burgess, G.K.	Metals for pyrometer standardization, Bull. A.I.M.E., 152, p. 1511.
81	C 35	1919		Melting points of chemical elements and other standard temperatures; 5¢.
82		1919	Burgess, G.K.	Temperature measurements in steel furnaces, Yearbook Am. Iron & Steel Inst., p. 427.
83		1919	Burgess, G.K.	Science and the after-war period. Sci. Monthly, Feb. 1919; Jour. Wash. Acad. Sci., 9, p. 57.
84	T 109	1919	Burgess, G.K., Woodward, R.W.	Conservation of tin in bronzes, bearing metals and solders, 5¢. Trans. A.I.M.M.E. 60, p. 162.
85		1919	Burgess, G.K.	Recent metallurgical work at the Bureau of Standards, Blast Furnace & Steel Plant Vol. III, (1), pp. 130-131 & (2) pp. 195-97.
86		1919	Gurevich, L.J., Wickers, E.	Comparative tests of Palau and Rhotanium ware as substitutes for platinum laboratory utensils, Jour. Ind. & Eng. Chem. 11, p. 570.
87		1919	Gurevich, L.J., Hromatko, J.S.	Tin fusible boiler plug manufacture and testing, Bull. A.I.M.E., 152, p. 1351.
88		1919	French, H.J.	Manufacture and properties of light wall structural tubing, Bull. A.I.M.E. 153, p. 1855; Tr. A.I.M.M.E. 62, p. 303, (1920).
89		1919	Staley, H.F., Karr, C.P.	Physical properties of certain lead-zinc bronzes, Bull. A.I.M.E., 153, p. 2485.
90	S 343	1919	Sanford, R.L., Kouwenhoven, W.B.	Location of flaws in rifle steel by magnetic analysis, 5¢.

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91		1919	Staley, H. F.	Tests of clay for foundry uses, Tr. Am. Foundrymen's Assoc., <u>28</u> , p. 465.
92		1920		The metallurgical work of the Bureau of Standards, A.S.S.T., Feb. 25, 1921, Oct. 18, 1920.
93		1920	Howe, H. M., Groesbeck, E. C.	Prevention of columnar crystallization by rotation during solidification, Tr. A.I.M.M.E., <u>62</u> , p. 341.
94	T 163	1920	Howe, H. M., Groesbeck, E. C.	Stresses caused by cold rolling, 5p.
95		1920	Burgess, G. K.	Governmental research. Trans. Roy. Can. Inst. Toronto, V, XIII, No. 1. Science Monthly, pp. 341-352.
96		1920	Burgess, G. K.	The microscope and the heat treatment of steel, Yearbook, Am. Iron & Steel Inst. p. 154-73.
97		1920	Burgess, G. K.	Report of the pyrometer committee of the National Research Council, A. I. M. M. E.
98		1920	Burgess, G. K.	Aircraft steels: discussion of Prof. Sauveur's paper, Trans. A. I. M. M. E., <u>62</u> , p. 339-340.
99		1920	Woodward, R. W.	Recent developments in light aluminum alloys, Report of U.S. Advisory Committee for Aeronautics, 6, p. 35.
100		1920	Woodward, R. W.	Discussion of stresses set up by cold rolling, Proc. A.S.T.M., <u>20</u> (2), p. 38.
101	S 399	1920	Rawdon, H. S., Lorentz, M. G.	Metallographic etching reagents: I. For copper, 10p. B. of S. Bull. Vol. 16.
102	T 156	1920	Rawdon, H. S., Epstein, S.	Metallographic features revealed by the deep etching of iron and steel, 10p.

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103		1920	Rawdon, H.S.	Nature of the defects revealed by the deep etching of transversely fissured rails, Rail. Com. Am. Ry. Assn., 85, Chem. Met. Eng., 22, p. 505.
104		1920	Rawdon, H.S., Jordan, L., Groesbeck, E.C.	Metallography of arc-fused steel, Chem. Met. Eng., 23, p. 277-84.
105	S 356	1920	Rawdon, H.S., Scott, H.	Notes on microstructure of iron and mild steel at high temperature, 10¢. Tr. A.I.M.E., 62, pp. 246-86; Chem. Met. Eng. 22, p. 737; B. of S. Bull. Vol. 15, pp. 519-528.
106	T 158	1920	Rawdon, H.S., Langdon, S.C.	A peculiar type of intercrystalline brittleness of copper, 5¢. Bull. A.I.M.E. 158, Sec. 19.
107	S 402	1920	Rawdon, H.S.	The use of ammonium persulphate for revealing the macrostructure of iron and steel, 5¢. B. of S. Bull. Vol. 16; Iron Age, 106, p. 965.
108	S 377	1920	Rawdon, H.S.	The intercrystalline brittleness of lead, 5¢. B. of S. Bull. Vol. 16; Bull. A.I.M.E., 158, Sec. 7.
109	T 143	1920	Rawdon, H.S., Krynitsky, A.I.	A study of the deterioration of nickel spark plug electrodes in service.
110	T 179	1920	Rawdon, H.S., Groesbeck, E.C., Jordan, L.	Electric arc welding of steel: I, Properties of the arc fused metal, 15¢.
111		1920	Rawdon, H.S.	Contemporary foreign opinions on sulphur and phosphorus in steels, Chem. Met. Eng., 22, p. 609-12.
112		1920	Rawdon, H.S.	Contribution to discussion of "Shattered zones in certain steel rails", A.S.T.M. 20, (2), p. 60.
113		1920	Rawdon, H.S.	Notes on electric welding, Mech. Eng., 42, p. 567-71; Elec. Railway Eng., 11, p. 441-6.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
114	LC149	1920	Rawdon, H.S.	Welding practice.
115		1920	French, H.J.	The heat treatment of a high chromium steel, Jnl. Soc. Am. Eng., 7, p. 103; Chem. Met. Eng., 23, p. 13.
116		1920	French, H.J.	Tensile properties of boiler plate at elevated temperatures, Bull. A.I.M.E., 158, Sec. 15; Tr. A.I.M.E., 67, p. 37 (1922).
117		1920	French, H.J.	Some applications of alloy steels in the automotive industry, A.S.M.E. Wash. Sec. March 30.
118	S 370	1920	Scott, H.	Critical ranges of some commercial nickel steels, 5¢. B. of S. Bull. Vol. 16; Bull. A.I.M.E. 158, Sec. 16; Tr. A.I.M.E., 67, p. 100 (1922).
119	S 395	1920	Scott, H.	The high temperature treatment of high-speed steel and its relation to secondary hardening and to red-hardness, 10¢. B. of S. Bull. Vol. 16; Tr. A.S.S.T., 1, p. 551-626.
120	S 396	1920	Scott, H., Movius, G.H.	Thermal and physical changes accompanying the heating of hardened carbon steels, 5¢.
121		1920	Scott, H., Movius, G.H.	Similarity of the magnetic change in ferrite and cementite, Chem. & Met. Eng., 22, p. 1069.
122	S 404	1920	Nusbaum, C., Cheney, W.L., Scott, H.	The magnetic reluctivity relationship as related to certain structures of an eutectoid carbon steel, 5¢. B. of S. Bull. Vol. 16.
123	T 172	1920	Strand, C.H.	Cast iron for locomotive cylinder parts, 10¢.

Ref.	Pub.	Date	Author	Title
124	S 363	1920	Waltonberg, R.G., Coblentz, W.W.	Preparation and reflective properties of some alloys of aluminum with magnesium and zinc 5¢. B. of S. Bull. Vol. 15.
125		1920	Langdon, S.C., Grossman, M.A.	The embrittling effects of cleaning and pickling upon carbon steels, Am. Electrochem. Soc., 37, p. 543.
126	S 397	1920	Rawdon, H.S., Jimeno-Gil, E.	A study of the relation between the Brinell hardness and the grain size of annealed carbon steels, 10¢. B. of S. Bull. Vol. 16.
127		1920	Cain, J.R.	New deoxidizers for steel manufacture, Chem. Met. Eng., 23, p. 879-902.
128	T 155	1920	Staley, H.F.	Cements for spark-plug electrodes, 5¢.
129		1921	Rawdon, H.S.	Some types of non-ferrous corrosion, Trans. Am. Electrochem. Soc., 39, p. 227.
130		1921	Rawdon, H.S.	Fusion welding - a new use for castings, Disc. of fusion welding. Yearbook Am. Iron & Steel Inst., p. 340-348.
131		1921	Rawdon, H.S.	Some observations on season cracking, Jour. Inst. Met., 25, p. 149.
132		1921	Rawdon, H.S.	Macroscopic examination of metals, Chem. Met. Eng., 24; p. 385-7.
133		1921	Rawdon, H.S.	Preparation of small specimens for microscopic examination, Chem. Met. Eng., 24, p. 475-6.
134		1921	Rawdon, H.S.	Effects of metallic structure upon properties, Chem. Met. Eng., 24, p. 523-27.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
135		1921	Rawdon, H. S.	The microscopic study of the structure of metals, Am. Mach., 55, p. 659.
136		1921	Rawdon, H. S.	The thermal characteristics of arc-fused steel, Contribution to discussion of: Heat treatment of arc welds. Welding Eng. 6, No. 5, p. 44-46.
137		1921	Rawdon, H. S., Grosbeck, E. C., Jordan, L.	Physical properties of arc-fused steel, Chem. Met. Eng., 28, p. 677-84.
138		1921	Rawdon, H. S.	The presence of internal fracture in steel rails and their relation to the behavior of the material under service stresses, Faraday Soc. 111, p. 470.
139		1921	Rawdon, H. S.	The uses of X-rays in the examination of steel. Metal Heating, 1, No. 1. pp. 14-18; reprinted from 1919 Yearbook of Am. Iron and Steel Inst.
140		1921	French, H. J.	Review of recent Japanese metallurgical investigations, Chem. Met. Eng. 24, Microstructure of chromium steels, p. 703-6; Recent work on chromium tungsten steels, p. 573-5; Structure of tungsten steels, p. 745-8.
141		1921	French, H. J.	Elements of the heat treatment of steel, Am. Mach., 55, p. 907, 960.
142		1921	French, H. J.	Artificial seasoning of steels, Chem. Met. Eng., 25, p. 155; Am. Mach., 55, p. 738.
143	T 206	1921	French, H. J., Johnson, G. W.	The effect of heat treatment upon the mechanical properties of one per cent carbon steels, 156. Tr. A.S.S.T., 2, p. 467.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
144		1921	French, H.J.	Discussion of "Comparative Tests of Steels at High Temperatures" by R. S. MacPherran in Proc. A.S.T.M., 21, p. 861.
145		1921	French, H.J.	Mechanical properties of steel at elevated temperatures below the critical range; contribution to discussion of "Comparative tests of steels at high temperatures", Proc. A.S.T.M. 21(2), p. 861.
146	T 205	1921	French, H.J.	Tensile properties of some structural alloy steels at high temperatures, 5¢. Trans. Am. Soc. Steel Treat., 11, p. 409.
147		1921	French, H.J.	Motion pictures in the physical testing laboratory, Chem. Met. Eng., 24, p. 131.
148	M 46	1921		War work of the Bureau of Standards, 70¢.
149	C 42	1921		Metallographic testing, 5¢.
150	T 203	1921	Groesbeck, E.C.	The effect of phosphorus upon the microstructure and hardness of low carbon open-hearth steels, 10¢.
151	S 405	1921	Nusbaum, C., Cheney, W.L.	Effect of rate of cooling on the magnetic and other properties of an annealed eutectoid carbon steel, 5¢. B. of S. Bull. Vol. 17.
152	T 178	1921	Burgess, G.K.	Steel rails from sink-head and ordinary rail ingots, 20¢. Chem. Met. Eng., 23, pp. 921-5, 969-75, 1017-22.
153	T 192	1921	Burgess, G.K.	Results of tests of centrifugally cast steel, 10¢. Trans. A.S.S.T., 1, p. 370.
154		1921	Burgess, G.K.	The government laboratory and industrial research, Science Monthly, 13, p. 523.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
155	T 188	1921	Woodward, R.W., Freeman, J.R. jr.	Some properties of white-metal bearing alloys at elevated temperatures, 5p.
156		1921	Woodward, R.W.	Structural properties of metal and alloys, Am. Mach., 55, p. 207.
157	T 185	1921	Krynitsky, A. I.	Experiments on copper crusher cylinders, 10p.
158	C 101	1921		Physical properties of materials, I. Strengths and related properties of metals and certain other engineering materials, 40p. (Revised 1924).
159	S 410	1921	Hidnert, P.	Thermal expansion of copper and some of its important industrial alloys, 25p. B. of S. Bull. Vol. 17.
160	C 100	1921	Merica, P.D.	Nickel, 40p. (revised 1924) (E.C. Groesbeck), Chem. Met. Eng. 24, p. 17-21, 73-6, 197-200, (Monel) 291-4, Iron nickel, 375-8; Copper nickel, 558-60; Miscellaneous 649-53.
161		1921	Merica, P.D., Waltenberg, R.G.	Some mechanical properties of hot-rolled Monel metal, Proc. A.S.T.M., 21, p. 922.
162		1921	Hromatko, J.S., Gurevich, L.	Note on the properties of antimonial lead, Chem. Met. Eng., 25, p. 62.
163		1921	Waltenberg, R.G.	Note on notched-bar impact tests and toughness of Monel metal, Chem. Met. Eng., 25, p. 322; Met. Ind. (London) 19, p. 229.
164		1921	Cain, J.R., Hostetter, J.C.	The coprecipitation of vanadic acid with ammonium phosphomolybdate, Jour. Am. Chem. Soc., 43, pp. 2552-2562.
165	C 26	1921		Analyzed iron and manganese ores - methods of analyses, 5p.

Ref.	Pub.	Date	Author	Title
166	T 309	1923	Burgess, G.K., Woodward, R.W.	Thermal stresses in chilled iron car wheels, 5¢.
167		1922	Burgess, G.K., Warwick, C.L.	Effect of sulphur on rivet steel, Preliminary report of the Joint Committee on Phosphorus and Sulphur in Steel, Proc. A.S.T.M., 22 (1), p. 94.
168		1922	Burgess, G.K.	S.W. Stratton Technology, Eng. News, 3, p. 146.
169		1922	Burgess, G.K.	Standardization and research, Am. Mining Congress, November.
170		1922	Burgess, G.K.	Discussion of corrosion of ferrous materials, Proc. Brit. Inst. Civ. Eng. 214, II, p. 183.
171		1922	French, H. J.	The effect of heat treatment on the mechanical properties of a carbon-molybdenum and a chromium-molybdenum steel, Tr. A.S.S.T., II, p. 769.
172		1922	French, H. J.	Strength and elasticity of boiler plate at elevated temperatures, Chem. Met. Eng. 26, p. 1207.
173		1922	French, H. J.	Boiler plate after cold work or work at blue heat, Chem. Met. Eng. 27, No. 5, p. 211.
174		1922	French, H. J.	Effect of rate of loading on tensile properties of boiler plate, Chem. Met. Eng. 27, No. 7, p. 309.
175		1922	French, H. J.	Stainless steel at high temperatures, The Iron Age, 110, p. 404.
176		1922	Rawdon, H. S.	Chemical and mechanical properties of arc-fused steel, Proc. Weld. Soc. Vol. III.
177		1922	Rawdon, H. S., Krynitsky, A. I., Berliner, J. F. T.	Brittleness developed in pure lead by stress and corrosion, Chem. Met. Eng., 26, p. 109.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
178		1922	Rawdon, H.S., Krynitsky, A.I., Berliner, J.T.T.	Brittleness developed in aluminum and duralumin by stress and corrosion, Chem.Met.Eng., 26, p. 154.
179		1922	Rawdon, H.S., Epstein, S.	Some observations on the "nick-bend" test for wrought iron, Proc.A.S.T.M., 22, (II), p. 193.
180	C 73	1922	Rawdon, H.S., Lorentz, F.G.	Copper (revised), 20¢.
181		1922	Rawdon, H.S., Krynitsky, A.I.	Resistance to corrosion of various types of chromium steels, Chem.Met.Eng., 27, p. 171.
182		1922	Rawdon, H.S.	Contributory factors in corrosion, contribution to discussion of preliminary notes on corrosion, Proc. A.S.T.M. 22 (2), p. 238.
183		1922	Vanick, J.S., White, A.E.	Nitrides and oxides in boiler tube steels, Trans. A.S.S.T., II, p. 525.
184		1922	Rawdon, H.S.	Deterioration of alloys by internal oxidation. Contribution to discussion of the oxidation and swelling of zinc-aluminum alloys, A.I.M.M.E. pamphlet 1190.
185	C 80	1922	Rawdon, H.S.	Protective metallic coatings and the rust proofing of iron and steel, (Revised) 20¢.
186		1922	Scott, H.	Discussion of "the spontaneous formation of martensite from austenite", Chem.Met.Eng. 23, p. 1154.
187		1922	Scott, H.	The decomposition of martensite into troostite in alloy steels, Forging & Heat Treat., 8, p. 296.

Ref.	Pub.	Date	Author	Title
188		1922	Vanick, J. S.	The mechanical properties of chrome-vanadium steels, Trans. Am. Soc. Steel Treat., 3, p. 196.
189	T 221	1922	Marshall, L. H., Sanford, R. L.	The magnetic susceptibility and iron content of tin-red-brass, 5¢.
190		1922	Freeman, J. R. jr.	The physical properties of the A. S. T. M. tentative standard white-metal bearing alloys, Proc. A. S. T. M. 22(1), p. 207.
191		1922	Freeman, J. R. jr.	Contribution to discussion of white metal alloys, Jour. Inst. Met., 28, p. 174.
192		1922	Freeman, J. R. jr., Peterson, J. B.	On precision altimeter design, Report 126, Natl. Advisory Committee for Aeronautics.
193	S 453	1922	Neville, R. P., Cain, J. R.	The preparation and properties of pure iron alloys, I. Effect of carbon and manganese on the mechanical properties of iron, 10¢. B. of S. Bull. Vol. 18; Tr. Am. Electrochem. Soc. 42, p. 21.
194	S 448	1922	Jordan, L., Swindells, F. E.	The decarburization of ferro-chromium by hydrogen, B. of S. Bull. Vol. 18; Chem. Met. Eng. 27, p. 1071.
195	T 207	1922	Burgess, G. K., Woodward, R. W.	Manufacture and properties of steel plates containing zirconium and other elements, 20¢.
196		1922		Graphitization of white cast-iron below the A_1 transformation. Disc. of Malleabilizing of white cast iron, Tr. A. I. M. M. E., 67, p. 488.
197	C 113	1922	Rawdon, H. S.	Structure and related properties of metals, 25¢; also Tr. A. S. S. T., 3, p. 649.

Ref.	Pub.	Date	Author	Title
198		1922	Rawdon, H. S.	Metallographic factors in carburization, Tr. A.I.M.E., 67, p. 377.
199		1922	Rawdon, H. S., Krynitsky, A. I., Berliner, J. F. T.	Corrosion patterns on cold worked tin and zinc, Chem. Met. Eng., 26, p. 212.
200	S 435	1922	Rawdon, H. S., Lorentz, M. G.	Metallographic etching reagents, II. for copper alloys, nickel and the alpha alloys of nickel, 15¢. B. of S. Bull. Vol. 17.
201		1922	Rawdon, H. S., Lorentz, M. G.	Contrast etching for metallographic specimens, Chem. Met. Eng., 25, p. 915.
202		1922	Rawdon, H. S., Lorentz, M. G.	Concentrated hydrochloric acid as a metallographic etching reagent for nickel, Chem. Met. Eng. 25, p. 955.
203	S 452	1922	Rawdon, H. S., Epstein, S.	The structure of martensitic carbon steels and the changes in microstructure which occur upon tempering, 15¢. B. of S. Bull. Vol. 18.
204		1922	Rawdon, H. S.	Some metallographic features of manganese bronze, contribution to the discussion of: The blue-constituent in high-strength manganese bronze, Bull. A. I. M. E., Tr. A. I. M. E., 68, p. 630.
205	S 464	1922	Rawdon, H. S., Sillers, F. jr.	Preparation and properties of pure iron alloys: The effect of manganese on the structure of alloys of the iron carbon system, 10¢. Iron Age 110, p. 1357-61; B. of S. Bull. Vol. 18.
206		1922	Rawdon, H. S., Epstein, S.	Graphitization of a carbon tool-steel, Chem. Met. Eng. 27, p. 650.
207	S 457	1922	Jordan, L., Swindells, F. E.	Gases in metals: I. The determination of combined nitrogen in iron and steel and the change in the form of nitrogen by heat treatment, Chem. Met. Eng., 27, pp. 1135 and 1170.

Ref.	Pub.	Date	Author	Title
208	T 228	1923	French, H.J., Strauss, J.	Lathe break-down tests of some modern high speed steels, 15¢. Trans. A.S.S.T., 2, p. 1125.
209	T 219	1923	French, H.J.	Effect of temperature, deformation, and the rate of loading on the tensile properties of low carbon steel below the thermal critical range, 10¢.
210		1923	French, H.J., Strauss, J., Digges, T.G.	Effect of heat treatment on lathe tool performance and some other properties of high speed steels, Tr. A.S.S.T., 4, p. 353.
211		1923	French, H.J., Tucker, W.A.	Strength of steels at high temperatures, Iron Age, 112, p. 193-275.
212		1923	French, H.J., Strauss, J.	Tests for purchasing high speed steels, Forging, Stamping and Heat-Treating, 9, p. 376.
213		1923	French, H.J.	Discussion of "Influence of Temperature on Charpy Impact Value of Steels" by F.C. Langenberg, Yearbook Am. Iron & Steel Inst., p. 377.
214		1923	Burgess, G.K.	The study of steels for engineering structures, Proc. Am. Soc. Civ. Eng., 49, p. 524-47; Iron Trade Rev., 72, p. 443-5, 508-10; Iron Age 111, p. 281.
215		1923	Burgess, G.K., Warwick, C.L.	Second preliminary report, Joint Committee on Investigation of Sulphur and Phosphorus in Steel, Proc. A.S.T.M., 23 (1), p. 105
216		1923	Burgess, G.K.	Presidential address, the trend of standardization. June meeting A.S.T.M., 23 (1), p. 40.
217		1923	Neville, R.P.	The preparation of platinum and platinum-rhodium alloy for thermal couples, Tr. Am. Electrochem. Soc., 43, p. 371.

Ref.	Pub.	Date	Author	Title
218		1923	Rawdon, H.S.	Structure and related properties of metals, Trans. A.S.S.T., 3, pp. 649-79.
219		1923	Blum, W., Rawdon, H.S.	The influence of the base metal on the structure of electrodeposits, Trans. Am. Electrochem. Soc., 44, p. 313.
220		1923	Epstein, S.	The microscopic examination of "dirty" steel, Chem. Met. Eng., 28, p. 482.
221		1923	Blum, W., Rawdon, H.S.	The crystalline form of electrodeposition of metals, Tr. Am. Electrochem. Soc., 44, p. 597.
222		1923	Vanick, J.S., Sveshnikoff, W.W.	Thermal transformations in some chrome vanadium steels, Tr. A.S.S.T., 3, p. 502.
223		1923	Foley, F.B., Clayton, C., Burnholz, H.S.	Review of present status of drill steel breakage and heat treatment, Tr. A.I.M.E., 69, p. 84.
224	T 235	1923	Burgess, G.K., Quick, G.W.	Thermal stresses in steel car wheels, 15¢. Railway Age, 74, p. 951.
225		1923	French, H.J.	A recording chronograph for the inverse-rate method of thermal analysis, 5¢. Tr. A.S.S.T., 3, p. 640.
226		1923	Clayton, C.	Hardness and heat treatment of mining drill shanks, Tr. A.I.M.E., 1208-M.
227		1923	Scott, H.	The effect of high temperature quenching on the microstructure of high carbon steels, Trans. A.S.S.T., 3, p. 593.
228	T 241	1923	Burgess, G.K., Quick, G.W.	A comparison of the deoxidation effect of titanium and of silicon on the properties of rail steel, 10¢.

Ref.	Pub.	Date	Author	Title
229		1923	Scott, H.	The magnetic change in silicon and in chromium steels, Chem. Met. Eng., 28, p. 213.
230		1923	Howe, H.M., Foley, F.B., Winlock, J.R.	Influence of temperature, time and rate of cooling on the physical properties of carbon steel, Tr. A.I.M.M.E., 69, p. 722.
231		1923	Rawdon, H.S.	Discussion: Low temperature brittleness in silicon steels, Tr. A.I.M.M.E., 69, p. 789.
232		1923	Rawdon, H.S.	The scratch-hardness method. Contribution to discussion of "A study of bearing metals", Tr. A.I.M.M.E., 59, p. 983.
233	S 452	1923	Rawdon, H.S., Epstein, S.	Structure of martensitic carbon steels and changes in micro-structure on tempering, 15¢.
234	S 464	1923	Rawdon, H.S., Sillers, F. jr.	Preparation and properties of pure iron alloys, III. Effect of Mn on structure of Fe-C alloys, 10¢.
235	C 68	1923	Groesbeck, E.C.	Inver and related nickel steel (rewritten) 10¢.
236	T 245	1923	Marshall, L.H.	Embrittlement of malleable cast iron produced by heat treatment, as revealed by impact tests, 5¢.
237		1923	Marshall, L.H.	Contribution to discussion of experiments with sherardizing, Am. Inst. Min. Met. Eng., 68, p. 764.
238		1923	Vanick, J.S., Herschman, H.K.	Coatings for selective carburization, Tr. A.S.S.T. 3, p. 305.
239		1923	Freeman, J.R. jr., Brandt, P.F.	The influence of ratio of length to diameter in the compression testing of babbitt metals, Proc. Am. Soc. Test. Mat. 23(2), p. 150.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
240		1923	Vanick, J. S.	Deterioration of steel and wrought iron tubes in hot gaseous ammonia, Tr. A.S.S.T., Vol. IV, (July), p. 62.
241		1923	Jordan, L.	Gases in metals, Proc. A.S.T.M., <u>23</u> (2), p. 7.
242	C 78	1923	Merica, P. D., Gurevich, L.	Solders for aluminum, 5p. Met. Ind. (1913), p. 500.
243	X 63	1923		Report of Board Visitors to Bureau of Standards of the Department of Commerce for the Secretary of Commerce, 5p.
244		1923	Hanson, D., Freeman, J. R. jr.	The constitution of the alloys of iron and nickel, Jour. Iron & Steel Inst., 107, No. 1, p. 301.
245		1923	Wickers, E., Jordan, L.	Investigations of the platinum metals at the Bureau of Standards, Tr. Am. Electrochem. Soc., <u>43</u> , p. 385.
246	C 25	1923		Standard samples - general information, 5p.
247		1923	Sveshnikoff, W. W.	Note on the swelling of machine gun barrels, Army Ordnance Journal, Vol. 3, No. 21.
248	S 463	1923	Cheney, W. L.	Preparation and properties of pure iron alloys. II. Magnetic properties of iron alloys, 16p.
249		1924	French, H. J., Tucker, W. A.	Available data on properties of irons and steels at various temperatures, Proc. A.S.T.M., <u>24</u> , (2), p. 56.
250		1924	French, H. J., Klopsch, O. Z.	Quenching diagrams for carbon steels in relation to some quenching media for heat treatment, Tr. A.S.S.T., <u>6</u> , p. 251.
251	S 484	1924	Berliner, J. F. T.	Preparation and properties of pure iron alloys. IV. Critical ranges of Fe-C alloys by the thermoelectric method, 5p.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>author</u>	<u>Title</u>
252	S 483	1924	Gilchrist, R.	Investigations on Pt metals. IV. Determination of Ir in Pt alloys, 5¢.
253	S 488	1924	Hidnert, P., Gero, W. B.	Thermal expansion of molybdenum, 10¢.
254	S 258	1924	Greene, T. W.	Strength of steel tubing under combined column transverse loading, 15¢.
255	C 101	1924	Petrenko, S. N. (2d Ed. Rev.)	Physical properties of materials. I. Strengths and related properties of metals and woods, 40¢.
256	M 62	1924	Petrenko, S. N.	Table of Brinell hardness numbers, 5¢.
257		1924	Petrenko, S. N.	Mechanical meaning of hardness numbers, Mech. Eng. 46, p. 926.
258	C 297	1924		U.S. Government Master Specifications for plastic fire-clay refractories, 5¢.
259	T 263	1924	Basquin, O. H.	Tangent modulus and strength of steel columns in tests, 20¢.
260	T 260	1924	Whittemore, H. L., Stang, A. H.	Tests of some girder hooks, 10¢.
261	C 58	1924	Groesbeck, E. C. (2d Ed. Rev.)	Invar and related nickel steels, 10¢.
262	T 275	1924	Tuckerman, L. B., Aitchison, C. S.	Design of specimens for short time fatigue tests, 5¢.
263	C 100	1924	Groesbeck, E. C. (2d Ed. Rev.)	Nickel and its alloys, 40¢.
264		1924	Jordan, L., Barrows, W. P.	Mercury poisoning from electric furnaces, Jour. Ind. Eng. Chem., 16, p. 898.
265	T 252	1924	Rawdon, H. S., Epstein, S.	The nick-bend test for wrought iron, 10¢.
266		1924	Rawdon, H. S., Krynitsky, A. I.	Notes on corrosion testing by different immersion methods, Tr. A.E.S., 46, p. 359.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
267		1924	Rawdon, H.S., Krynitsky, A.I., Finkeldey, W.H.	Types of apparatus for testing corrodibility of metals, Proc. A.S.T.M., <u>24</u> (2), p. 717.
268		1924	Rawdon, H.S., Mutchler, W.H.	Effect of severe cold working on scratch and Brinell hardness, Am.Inst.Min.Met.Eng. 70, p. 342.
269		1924	Rawdon, H.S.	Contribution to discussion of corrosion of brass as affected by grain size, Am.Inst.Min.Met. Eng., 70, p. 401.
270		1924	Rawdon, H.S.	Written discussion on Bain's paper, nature of martensite. Tr. A.I.M.M.E., 70, p. 37.
271	T 257	1924	Anderson, R.J., Fahlman, E.C. (work Bu. of Mines)	Development of a method for measurement of internal stress in brass tubing, 10¢.
272		1924	deSveshnikoff, W.W., Haring, H.E.	Electroplating worn machine gun barrels, Army Ordnance Journal, 5, p. 503.
273		1924	deSveshnikoff, W.W.	Carburization as a factor in the erosion of machine gun barrels, Army Ordnance Journal, 5, p. 794.
274	M 60	1924		Annual Report of the Director of the Bureau of Standards to the Secretary of Commerce for the fiscal year ended June 30, 1924, 10¢.
275		1924	Sager, T.P.	Report on corrosion tests of iron and steel submerged in running water at the Bureau of Standards and at Annapolis, Md. Proc. A.S.T.M., <u>24</u> , (1), p. 228.
276		1924	Vanick, J.S. (work of Fixed Nitrogen Res. Lab. at Bureau of Standards)	Deterioration of some metals in hot, reducing, ammonia gases, Proc. A.S.T.M., <u>24</u> , (2), p. 348.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
277		1924	Freeman, J.R. jr., Brandt, P.F.	Effect of impurities on compressive strength and hardness of Babbitt metals at normal and elevated temperatures, Proc. A.S.T.M., <u>24</u> (1), p. 253.
278		1924	Gillett, H.W., Mack, E.L. (work of Bureau of Mines)	Notes on some endurance tests of metals, Proc. A.S.T.M., <u>24</u> (2), p. 476.
279		1924	Gillett, H.W.	Chemistry in industry, Vol. 1, Chapt. 13, Non-ferrous metallurgy. The Chemical Foundation.
280		1924	Burgess, G.K., chairman.	Reports of Joint Committee on Investigation of Phosphorus and Sulphur in Steel, Proc. A.S.T.M. <u>24</u> , (1), pp. 96, 108, 185.
281		1924	Burgess, G.K.	Scientific work which our government is carrying on and its influence on the nation, Sci. Monthly, 19, Aug., p. 113.
282		1924	Scott, H.	Quenching properties of glycerin and its water solutions, Tr. Am. Soc. Steel Treat., <u>6</u> , p. 13.
283		1924	Scott, H.	Written discussion on Bain paper, nature of martensite. Tr. A.I.M.M.E., <u>70</u> , p. 42.
284		1924	Sanford, R.L.	The present status of magnetic analysis, Tr. A.S.S.T., <u>5</u> , p. 577.
285		1924	Logan, K.H.	Corrosion of underground pipe lines, Chem. Met. Eng., <u>31</u> , p. 1011.
286		1924	Waltenberg, R.G. (Res. Assoc.)	Measuring metal's resistance to shock, Chem. Met. Eng. <u>31</u> , p. 657.
287		1924	Krynitsky, A.I.	Written discussion on Krivobok and Romig paper - surface vs inner structure, Tr. A.S.S.T., <u>6</u> , p. 630.

Ref.	Pub.	Date	Author	Title
288	T 261	1925	Cain, J.R. (Res. Assoc.)	Influence of S, O, Cu and Mn on red-shortness of iron, 10¢.
289		1925	Cain, J.R., (Res. Assoc.) Peterson, A.A.	A laboratory high frequency vacuum furnace, Tr. Am. Electrochem. Soc., 48, p. 138.
290	T 267	1925	Freeman, J.R. jr., Derry, A.T.	Effect of hot-rolling conditions on the physical properties of a carbon steel, 10¢.
291	T 288	1925	Freeman, J.R. jr., France, R.D.	Comparative cold-rolling tests of open-hearth steel strip (deep drawing stock) and electrolytic iron strip, 10¢.
292	S 497	1925	Hidnert, P.	Thermal expansion of aluminum and its alloys, 15¢.
293	T 281	1925	Merica, P.D., Waltenberg, R.G. (Res. Assoc.)	Malleability and metallography of nickel, 10¢.
294		1925	Merica, P.D., Waltenberg, R.G. (Res. Assoc.)	The malleability of nickel, A.I.M.M.E., 71, p. 709.
295	T 285	1925	Anderson, R.J., Fahlman, E.G. (Work of Bureau of Mines)	Release of internal stress in brass tubing, 15¢.
296	T 289	1925	Petrenko, S.N.	Impact and slow bending notched bar tests, 20¢.
297		1925	Petrenko, S.N.	Comparative slow bend and impact notched bar tests on some metals, Tr. A.S.S.T., 8, Nov., p. 519.
298	T 296	1925	French, H.J., Tucker, W.A.	Flow in a low-carbon steel at various temperatures, 10¢.
299	T 295	1925	French, H.J., Klopsch, O.Z.	Initial temperature and mass effects in quenching, 10¢.
300		1925	French, H.J.	Written discussion on Jasper paper - Static and fatigue tests at elevated temperatures, Proc. A.S.T.M., 25 (2), p. 34.

Ref.	Pub.	Date	Author	Title
301		1925	French, H. J., Digges, T. D.	Experiments with nickel, tantalum, cobalt and molybdenum in high speed steels, Tr. A.S.S.T., <u>8</u> , p. 687.
302		1925	French, H. J.	Discussion, properties of metals at high temperatures, Proc. A.S.T.M., <u>25</u> (2), p. 34.
303		1925		National Directory of Commodity Specifications (27,000 specifications listed) \$1.25.
304	M 69	1925		Annual Report of the Director of the Bureau of Standards for the fiscal year ended June 30, 1925, <u>5</u> .
305		1925	Rawdon, H. S., Epstein, S.	Metallographic study of welded rails, included in Progress Report No. 3, Committee on Welded Rails, Jour. Am. Weld. Soc., <u>4</u> , p. 90.
306		1925	Rawdon, H. S., Hidnert, P.	Note, Observations on the "hydrogen point" in iron, Phys. Rev., <u>25</u> , p. 898.
307		1925	Rawdon, H. S., Sillers, F. jr.	Note, Observations on the transformation in austenitic steel as induced by cooling in liquid air, Phys. Rev., <u>25</u> , p. 898.
308		1925	Rawdon, H. S.	Report of Subcommittee V and E-4 on micro-hardness, Proc. A.S.T.M., <u>25</u> , (1), p. 442.
309		1925	Rawdon, H. S.	Written discussion on Poluskin paper - metallographic planimeter, A.I.M.M.E. <u>71</u> , p. 687.
310		1925	Rawdon, H. S.	Report on Subcommittee VII of A-5 on accelerated corrosion tests, Proc. A.S.T.M., <u>25</u> (1), p. 103.
311		1925	Saeger, C. M. jr.	Classification and testing of molding sands, included in committee reports, Tr. Am. Fdy. Assn., <u>22</u> (2), pp. 131, 232.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
312		1925	Logan, K.H.	Report of soil corrosion investigation, Am. Fdy. Assn. preprint No. 447.
313		1925	Gillett, H.W., Mack, E.L. (work of Bureau of Mines)	Molybdenum, cerium and related alloy steels, Tech. Monograph Series, Am. Chem. Soc. Chem. Datalog Company.
314		1925	Gillett, H.W.	Written discussion on Hibbard paper - Melting temperature of steel, A.I.N.E.E., <u>71</u> , p. 496.
315		1925	Gillett, H.W.	Active metallurgical research, Iron Age, <u>116</u> , Aug. 27, p. 536.
316		1925	Gillett, H.W.	Standards Bureau metal research, Iron Age, <u>116</u> , Aug. 20, p. 461.
317		1925	Blum, W.	Chemistry in industry, Vol. II. Chapt. 12, Electroplating and electro-forming, The Chemical Foundation.
318		1925	Blum, W.	Teaching principles of electrodeposition, Jour. Chem. Education, 2, July, p. 553.
319		1925	Burgess, G.K.	Gages, a key problem, Jour. Soc. Auto. Eng., <u>13</u> , p. 456.
320		1925	Burgess, G.K.	Work of the Bureau of Standards, Military Engrs., <u>17</u> , p. 455, Nov.-Dec.
321		1925	Burgess, G.K.	What the Bureau of Standards is doing for American industry, Industrial Management, <u>70</u> , November, p. 257.
322		1925	Souder, W.	Physical properties of dental materials, Jour. Am. Dental Assn., May.
323		1925	Coleman, R.L. jr., (Res. Assoc.)	Physical properties of dental materials, Vol. II. Wrought gold alloys, Jour. Am. Dental Assn., May.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
324		1925	Rosenberg, S.J.	Written discussion on Honda and Yamada paper - Wear of metals, Brit. Inst. of Metals, <u>33</u> , p. 69.
325		1925	Rosenberg, S.J.	Lead filings and zinc dust as pipe jointing material, Am. Gas Assoc. Monthly, <u>7</u> , p. 701.
326		1925	Meggers, W.F.	Periodic structural regularities in spectra as related to the periodic law of the chemical elements, Natl. Academy of Science, <u>11</u> , January, p. 43.
327		1925	Krynitsky, A.I.	Written discussion on Malinovsky paper - Enameling defects due to cast iron, Am. Ceramic Soc., <u>8</u> , October, p. 618.
328		1925		Avoids softness in carburizing (abstract of 2d progress report) Iron Trade Rev., <u>77</u> , p. 308.
329		1925	Lundell, G.E.F., Knowles, H.B.	Determination of uranium, Jour. Am. Chem. Soc., <u>47</u> , p. 2637.
330		1925	Thompson, M.R.	Nickel plating of zinc and zinc base die castings, Am. Electrochem. Soc., <u>47</u> , p. 163, L. C. 163.
331		1925	Thomas, C.T., Blum, W.	Protective value of nickel plating, Tr. Am. Electrochem. Soc., <u>48</u> , p. 69, L. C. 172.
332		1925	Winkler, J.H. (Res. Assoc.) Blum, W.	Nickel electrotyping solutions, International Association of Electrotypers.
333		1925	Chase, C.E.	Research and experimental tests in connection with the design in the bridge over the Delaware between Philadelphia and Camden, Engineers & Engineering, <u>42</u> , August, p. 197.
334		1925	Jordan, L., Eckman, J.R., Jominy, W.E.	Oxygen content of coke and charcoal cast iron, Am. Foundry Assn., October, preprint No. 479.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
335		1925	Haring, H.E.	Principles and operating conditions of chromium plating. Chem. Met. Eng., 32, p. 692, 756; Brass World 21, p. 395; Met. Ind. (Lond.) 27, p. 310; Mon. Rev. Am. Electroplaters Soc. 12; L.C. 177.
336		1925	Sanford, R.L.	Magnetic analysis needs more study. Iron Tr. Rev., 77, Sept. 3, p. 555.
337		1926		Sodium chloride "spray" test; described in Bur. of Standards Circ. 80, Proc. A.S.T.M., 24 (2), p. 726; 26 (1), p. 144.
338		1926		Rate of loading, sand test. Am. Fdy. Assn., 34, p. 536.
339	R 54	1926		Sterling silver flatware. 5¢.
340		1926		Chromium plating of gages proves successful, Auto. Ind., 55, Dec. 30, p. 1080.
341		1926		Wear test for plug gages, Western Machy. Wld., 17, Dec., p. 535.
342		1926		Sand testing spring compression apparatus, Am. Fdy. Assn., 34, p. 487.
343		1926		Sand sintering test, Am. Fdy. Assn., 34, pp. 527, 556.
344	M 72	1926		Strain lines developed by compressive tests on structural members of the Delaware River Bridge at the Del. River Bridge Joint Commission, 5¢.
345		1926	Burgess, G.K.	Effect of sulphur on rivet steel: conclusions. Proc. A.S.T.M. 26 (1) p. 114; Chem. Abst., 21, 1927, p. 1436.
346		1926	Burgess, G.K.	Organization and work of the U.S. Bureau of Standards, Jnl. Chem. Educ., 3, p. 7.
347	S 517	1926	Davis, R.	A special camera for photographing cylindrical surfaces, 10¢.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
348		1926	Epstein, S.	Discussion of irregular carburization of iron alloys, Tr. Am.Soc.Steel Treat., <u>9</u> , p. 920.
349		1926	Eckman, J.R., Jordan, L., Jominy, W.E.	Oxygen affects charcoal iron, Foundry, <u>54</u> , page 506.
351		1926	Fairchild, C.O., Roeser, W.F.	Pyrometry of molten brass, Am. Fdy. Assn., 34, p. 675.
352		1926	Freeman, J.R. jr.	Recrystallization temperatures of cold rolled electrolytic iron and open hearth steel strip. Tr. Am.Soc.Steel Treat., <u>9</u> , p. 67.
353		1926	Freeman, J.R. jr. Quick, G.W.	Tensile properties of soldered joints under prolonged stress, Met. Ind., 24, p. 7.
354	S 522	1926	Freeman, J.R. jr. Sillers, F., jr., Brandt, P.F.	Pure zinc at normal and elevated temperatures, 15p.
355		1926	Foote, P.D.	Relation between metallurgy and atomic structure. Am.Inst.Min. & Met.Engrs., 73, p. 628.
356		1926	French, H.J.	Application of heat treated steels to industrial uses, Abst. of lecture, Am.Soc.Steel Treat., 9, p. 997.
357		1926	French, H.J.	Metals for service at high temperatures, Chem. Met. Eng., 33, p. 591.
358		1926	French, H.J.	Metals to resist corrosion or high temperatures, Am. Electrochem. Soc., 50, p. 47.
359		1926	French, H.J.	Methods of test in relation to flow in steels at various temperatures, Proc. Am.Soc. Test.Matls., 26 (2), p. 7.
360		1926	French, H.J., Digges, T.G.	Rough turning tests on alloy steels, Am.Mach., 65, Dec. 9, p. 957.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
361		1926 1927	French, H. J., Diggcs, T. G.	Rough turning with particular reference to the steel cut, West. Machy. Wld., 17, Dec., p. 533; Mech. Engng. 49, 1927, p. 339-52. A. S. M. E.
362		1926	French, H. J., Herschman, H. K.	Wear of steels with particular reference to plug gages, Tr. Am. Soc. Steel Treat., 10, p. 683.
363		1926	French, H. J., Klopsch, O. Z.	Initial temperature and mass effects in quenching, Tr. Am. Soc. Steel Treat., 9, p. 33.
364		1926	French, H. J., Klopsch, O. Z.	Mass effects in quenching, Fuels and Furnaces, 4, p. 435.
365	T 313	1926	French, H. J., Klopsch, O. Z.	Some characteristics of quenching curves, 10 ⁶ . Am. Soc. Steel Treat., 9, p. 8.
366		1926	Gillett, H. W.	Behavior of steel under repeated stress, Am. Soc. Steel Treat., 10, p. 159.
367		1926	Gillett, H. W.	Chemistry in the metallurgical division of the Bureau of Standards, Jnl. Chem. Educ., 3, p. 148.
368		1926	Gillett, H. W.	Government co-operates in research, Iron Age, 118, p. 673.
369		1926	Gillett, H. W.	The problem of materials for extreme conditions, Am. Electrochem. Soc., 50, p. 35.
370		1926	Gillett, H. W.	Research work of the Bureau of Standards, Forging, Stamping, Heat Treating, 12, p. 368.
371		1926	Gillett, H. W.	Research work at the Bureau of Standards, Blast Fur. & Steel Plant, 14, December, p. 515.
372		1926	Gillett, H. W.	Silicon as an alloy in steel, Iron Age, 118, p. 481; Met. Ind. (Lond.), 29, p. 248.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
373	BH - 8	1926	Gries, J.M.	Recommended building code requirements for unit working stresses in building materials, 10¢.
374	S 518	1926	Groesbeck, E.C.	Metallographic etching reagents, III. For alloy steels, 25¢.
375		1926	Groesbeck, E.C.	Report on etching reagents for alloy steels, A.S.T.M.
376		1926	Groesbeck, E.C.	Solutions for carbides, etc. in alloy steels, Proc.A.S.T.M. 26 (1), p. 569.
377		1926	Haring, H.E.	Chromium plating on printing plates, Met.Ind. 24, p. 68.
378		1926	Haring, H.E.	A simple method for measuring polarization and resistivity, Am.Electrochem.Soc. April, 49, p. 417.
379	T 337	1926	Heuligan, G.H.	Statical hysteresis in the flexure of bars, 10¢.
380	S 515	1926	Hidnert, P., Sweeney, W.T.	Thermal expansion of tungsten, 5¢.
381		1926	Ingberg, S.H., Sale, P.D.	Compressive strength and deformation of structural steel and cast-iron shapes at temperatures up to 950°C (1742°F), Proc.A.S.T.M., 26 (2), p. 33.
382	T 327	1926	Johnston, R.S.	Compressive strength of column web plate and wide web columns, 20¢.
383		1926	Johnston, R.S.	Strain detection in mild steel by wash coating, Proc. Brit. Iron & Steel Inst., CXII, No. II, p. 342, 1925.
384		1926	Jordan, L., Eckman, J.R.	Determination of oxygen and hydrogen in metals by fusion in vacuum, Ind. & Eng. Chem., 18, p. 279; Met. Ind.(Lond.), 28, p. 387.

Ref.	Pub.	Date	Author	Title
385	S 514	1926	Jordan, L., Eckman, J.R.	Gases in metals, II. The determination of oxygen and hydrogen in metals by fusion in vacuum, 106.
386		1926	Jordan, L., Peterson, A.A., Phelps, L.H.	Refractories for use in melting pure metals, iron, nickel, platinum, Am. Electrochem. Soc., 50, p. 47; Met. Ind. (Lond.) 29, p. 367; Brass Wld., 22, p. 355.
387		1926	Kjerrman, B. (Res. Fellow)	Effect of manganese, silicon, and phosphorus on the pearlite interval, Tr. Am. Soc. Steel Treat., 9, p. 430.
388		1926	Kjerrman, B. (Res. Fellow)	Some comments on Swedish steel practice, Tr. Am. Soc. Steel Treat., 9, p. 585.
389		1926	Lundell, G.E.F.	Rapid determination of small amounts of aluminum in certain non-ferrous materials, Ind. & Eng. Chem., 18, p. 60.
390		1926	Merritt, G.E.	Thermal expansion of some fused oxides used as refractories, Am. Electrochem. Soc., 50, p. 165.
391		1926	Petrenko, S.N.	Elastic ring verification of Brinell hardness testing machines, Tr. Am. Soc. Steel Treat., 9, March, p. 420.
392		1926	Quick, G.W.	Laboratory tests on non-ferrous screen wire cloth, Proc. Am. Soc. Test. Matls. 26 (1), p. 492.
393		1926	Quick, G.W.	Report of Subcommittee IV of D-14 on Testing Screen Wire Cloth, Proc. A.S.T.M., 26 (1), p. 492.
394		1926	Rawdon, H.S.	Accelerated corrosion tests, Com. A-5, Proc. Am. Soc. Test. Matls., 26 (1), p. 144.
395		1926	Rawdon, H.S.	Note on the protection of iron by cadmium, Met. Ind. (Lond.) 28, p. 414; Met. Ind., 24, p. 27. Am. Electrochem. Soc.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
396		1926	Rawdon, H. S.	Report of Subcommittee V of E-4 on Micro-Hardness, Am. Soc. Test. Matls., <u>26</u> (1), p. 572.
397		1926	Rawdon, H. S., Epstein, S.	Observations on phosphorus in wrought iron made by different puddling processes, Am. Iron & Steel Inst. (May).
398		1926	Rawdon, H. S., Hidnert, P., Tucker, W. A.	Some effects of hydrogen on iron and their bearing on a reported transformation at 370°C (698°F), Tr. Am. Soc. Steel Treat., <u>10</u> , p. 232.
399		1926	Roller, L. H.	Tests on welded pressure vessels, Proc. Am. Soc. Refrig. Engrs., Jan., p. 215.
400	S 510	1926	Sanford, R. L., Cheney, W. L.	Effect of wear on the magnetic properties and tensile strength of steel wire, 5¢.
401	T. 315	1926	Sanford, R. L.	Non-destructive testing of wire rope, 10¢.
402		1926	Scott, H.	Dimensional changes accompanying the phenomena of tempering and aging tool steels, Tr. Am. Soc. Steel Treat., <u>9</u> , p. 277.
403	S 513	1926	Scott, H.	Origin of quenching cracks, 20¢.
404	S 532	1926	Swanger, W. H.	Analysis of dental gold alloys, 10¢.
405		1926	Thompson, M. R.	Acid zinc plating baths, Am. Electrochem. Soc., <u>50</u> , p. 193.
406	BH-9	1927		Recommended building code requirements for working stresses in building materials, 10¢.
407		1927		Sand testing methods, Am. Fdy. Assn., <u>35</u> , p. 179.
408	M 90	1927		Directory of Commercial Testing and College Research Laboratories, 15¢.
409		1927		Tests of French cast iron pipe, Iron Age, <u>119</u> , Jan. 13, p. 141.

Ref.	Pub.	Date	Author	Title
410		1927		Test results on cast iron pipe, Iron Age, 119, p. 214; Trans. Am. Soc. Steel Treat., 11, p. 484.
411	C 328	1927		Testing of measuring tapes at the Bureau of Standards. 10¢.
412	C 25	1927		Standard samples. General information, 5¢.
413	C 140	1927		U. S. Master Specification for wood screws, 5¢.
414	C 242	1927		U. S. Government master specification for gaskets, asbestos metallic cloth, 5¢.
415	C 243	1927		U. S. Government Master Specification for packing, asbestos metallic cloth sheet, 5¢.
416		1927	Berglund, T.	Disc. of S. Ramura's paper on Psuedo-twinning in ferrite, Brit. Iron & Steel Inst. Not yet publ.
417		1927	Blum, W.	Chromium plating, Met. Ind., 25, January, p. 14.
418		1927	Blum, W.	Electroplating (symposium, Chemistry in automotive transportation), Ind. & Eng. Chem., 19, p. 1111.
419		1927	Blum, W., Rawdon, H. S.	Principles of electrolytic corrosion, Presented at the Amer. Electrochem. Soc., May, Preprint 48.
420	S 562	1927	Cross, H., Hill, E. E.	Density of hot-rolled and heat treated carbon steels, 10¢.
421		1927	Epstein, S., Rawdon, H. S.	Progress in study of normal and abnormal steel, Tr. Am. Soc. Steel Treat., 12, p. 337.
422		1927	French, H. J.	Comparison of the alloying elements Cr, Ni, Mo, V in structural steels, Tr. Am. Soc. Steel Treat., 11, p. 845.
423		1927	French, H. J. et al.	Comparative high-temperature tension tests on a C and a Cr-Mo steel, Mech. Eng., 49, p. 1114.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
424		1927	French, H.J.	Wear testing of metals, Proc. Am. Soc. Test. Matls., 27 (2), p. 213; Engng., (Lond.), 124, p. 279.
425		1927	French, H.J., Digges, T.D.	Machineability of steel, Iron & Steel Wld., 1, p. 423; abst. of A.S.M.E. paper.
426	T 363	1927	Freeman, J.R. jr., Dowdell, R.L., Berry, W.J.	Endurance properties of rail steel (ordinary and sink-head ingots).
427	T 344	1927	Fulmer, I.H.	Comparison of American, British and German standards for metal fits, 10 6 .
428		1927	Gilchrist, R.	Data on the assay of rolled gold plate, Ind. Eng. Chem., 19, p. 827.
429		1927	Gillett, H.W.	Active year at Bureau of Standards, Iron Age, 120, p. 327.
430		1927	Gillett, H.W.	Alloys of iron. Discussion, Engng. Foundation Bulletin, No. 1, p. 10.
431		1927	Gillett, H.W.	Development of brass melting, Brass Wld., 23, p. 151.
432		1927	Gillett, H.W.	Development of electric brass melting in the United States, Chem. Age, 17, No. 423, p. 9.
433		1927	Gillett, H.W.	Disc. of Campbell's paper on electric brass melting, Jnl. Brit. Inst. Met., 37, p. 314.
434		1927	Gillett, H.W.	Disc. of paper by D.J. McAdam on Corrosion fatigue of non-ferrous metals, Proc. Am. Soc. Test. Matls., 27 (2), p. 141.
435	T 331	1927	Gillett, H.W.	High silicon structural steel, 15 6 .
436		1927	Gillett, H.W.	Miscellaneous non-ferrous metals and alloys in automotive transportation, Ind. Eng. Chem., 19, p. 109.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
437		1927	Gillett, H.W.	Non-ferrous electrothermics in America, Met. Ind. (Lond.), 31, p.55.
438		1927	Gillett, H.W.	Traces non-ferrous melting in electric furnaces, Fdy., 55, p.805.
439		1927	Gillett, H.W.	Twenty-five years of non-ferrous electrothermics, Fifteen years of electric brass melting, Am. Electrochem. Soc. Preprint No. 24. Brass Wld., 23, p. 151.
440		1927	Groesbeck, E.C.	Comments on work by Sisco and Hester etching reagents for carbon in alloy steels, Proc. Am. Soc. Test. Mat., 27(1), p.603.
441	T 346	1927	Haring, H.E., Barrows, W.P.	Electrodeposition of chromium from chromic acid baths, 15¢.
442		1927	Hendrickson, H.B.	Tension experiments on diaphragm metals, N.A.C.A. Tech. Note 261.
443	T 358	1927	Herschman, H.K.	Air hardening rivet steels, 15¢.
444		1927	Herschman, H.K., French, H.J.	Recent experiments relating to the wear of plug gages, Tr. Am. Soc. Steel Treat., 12, p. 921.
445	T 335	1927	Hidnert, P., Sweeney, W.T.	Thermal expansion of graphite, 5¢.
446	S 565	1927	Hidnert, P., Sweeney, W.T.	Thermal expansion of beryllium and aluminum-beryllium alloys, 10¢. also Phys. Rev., 29, p.616.
447		1927	Hidnert, P., Sweeney, W.T.	Thermal expansion of some nickel steels, Phys. Rev., 29, p. 911.
448	T 327	1927	Johnston, R.S.	Compressive strength of column web plates and wide web columns, 20¢.
449	S 563	1927	Jordan, L., Eckman, J.R.	Gases in Metals. III. The determination of nitrogen in metal by fusion in vacuum, 10¢.
450	T 348	1927	Jordan, L., Grenell, L.H., Herschman, H.K.	Tarnish resisting silver alloys, 15¢.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
451		1927	Jordan,L., Grenell,L.H., Herschman,H.K.	The tarnish resistance and some physical properties of silver alloys, Met.Ind.(Lond.), 30, May 13, p. 484; Am.Inst.Min.& Met. Engrs., Inst.Met.Div., p. 460.
452	S 548	1927	Kiess,C.C.	Wave length measurements in the arc and spark spectra of zirconium, 5p.
453	T(in prep)	1927	Kjermann,B., Jordan,L.	Determination of oxygen in iron by reduction with hydrogen in presence of Sb and Sn.
454		1927	Logan,K.H.	Bureau of Standards soil corrosion investigation. Second progress report on unprotected pipe. Am.Fdy.Assn., 35, p. 101.
455		1927	Logan,K.H.	Electrolysis and its place in considering soil corrosion, Oil & Gas Jnl., 26, p. G224.
456	C 346	1927	Lorentz,M.G., et al.	Light metals and alloys, aluminum and magnesium, \$1.10.
457	T 355	1927	McCollum,B., Logan,K.H.	Electrolysis testing, 30p.
458		1927	McKee,S.A.	Effect of running-in on journal performance, Mech.Eng., 49, p.1335.
459	S 551	1927	Meggers,W.F., Walters,F.M.	Absorption spectra of iron, cobalt and nickel, 10p.
460	S 549	1927	Meggers,W.F.	Wave-length measurements in the arc spectrum of scandium, 5p.
461		1927	Mohler,F.L., Moore,H.R.	Absorption spectra of Hg, Cd, and Zn at high pressure, Opt. Sci. Am., 15, p. 74.
462	T 336	1927	Petrenko,S.N.	Comparative tests of six-inch cast iron pipes of American and French manufacture, 15p.
463	T 334	1927	Petrenko,S.N.	Relationship between the Rockwell and Brinell numbers, 15p.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
464		1927	Quick, G.W.; Jordan, L.	Iron-carbon-vanadium alloy for Brinell balls, Tr. Am. Soc. Steel Treat., 12, p. 3; Met., May, p. 75.
465		1927	Quick, G.W.	Report on screen-wire cloth, Report of Com. D-14, A.S.T.M., Proc. 1926, Pt. 1, p. 492.
466		1927	Rawdon, H.S.	Data in report of Com. B-3 on corrosion of non-ferrous metals and alloys, A.S.T.M., 27(1), p. 281.
467		1927	Rawdon, H.S.	Disc. of fatigue of cable sheath alloys, A.S.T.M., 27(2), p. 168.
468		1927	Rawdon, H.S.	"Ferroxyl" reagent in the laboratory study of corrosion, Min. & Met., 8, May, p. 229.
469		1927	Rawdon, H.S.	The intercrystalline corrosion of metal, Ind. & Eng. Chem., 19, May 1, p. 613; Met. Ind. (Lond.), 30, p. 647.
470	S 571	1927	Rawdon, H.S., Berglund, T.	Unusual features in the microstructure of ferrite.
471	T (in press)	1927	Rawdon, H.S., Groesbeck, E.C.	Effect of testing method on the determination of corrosion resistance of metals as illustrated by Cu-Ni alloys.
472	LC 230	1927	Saeger, C.M. jr.	Glycerine or ethylene glycol in foundry and facing mixtures.
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474	S 546	1927	Sanford, R.L.	Magnetic reluctivity relationship, 5p.
475	S 567	1927	Sanford, R.L.	Some principles governing the choice and utilization of permanent-magnet steels.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
476		1927	Sillers, F. jr.	Note on the crystal structure of electrodeposited chromium, Met. Ind. (Lond.) 30, May 27, p. 533; Am. Electrochem. Soc. Preprint 30.
477		1927	Stang, A. H.	Stresses in a rail due to a falling weight, Jnl. Am. Weld. Soc., 6, p. 64.
478	T 328	1927	Tuckerman, L. B., Stang, A. H.	Tests of large columns with H-shaped sections, 40¢.
479	T 361	1927	Vanick, J. S., deSveshnikoff, W., Thompson, J. G.	Deterioration of steels in synthesis of ammonia, 15¢.
480		1927	Whittemore, H. L.	Testing gas welds, Welding Eng., 12, Jan., p. 38.
481		1927	Wickers, E.	Inorganic and analytical chemistry of Au- Ag and Pt metals, Ann. Surv. Am. Chem. II.
482		1927	Wickers, E., Gilchrist, R., Swanger, W. H.	The purification of the six platinum metals, A. I. M. M. E. Tech. Publication 87.
483		1928		Laying the hard copper ghost, Foundry, 56, p. 71.
484	T 362	1928	French, H. J., Cross, H. C., Peterson, A. A.	Creep in Five steels at different temperatures, 15¢.
485		1928	French, H. J., Digges, T.	Effects of Sb, As, Cu and Sn in high speed steel, A. S. S. T. preprint.
486	LC 241	1928	Lorentz, M. G.	Bibliography of P and S in steel and cast iron.
487		1928	Rawdon, H. S.	Corrosion embrittlement of duralumin. I. Practical aspects of the problem, Tech. Note 282 - Natl. Adv. Com. for Aeronautics. II. Accelerated corrosion tests and the behavior of high strength aluminum alloys of different compositions. Tech. Note 283 - N. A. C. A.

<u>Ref.</u>	<u>Pub.</u>	<u>Date</u>	<u>Author</u>	<u>Title</u>
				III. The effect of the previous treatment on the susceptibility of sheet, Tech. Note 284-N.A.C.A.
				IV. The use of protective coatings, Tech. Note 285-N.A.C.A.
488		1928	Rawdon, H.S.	Protective metallic coatings (book). Am. Chem. Soc. Monograph Series No. 40.
489		1928	Roeser, W.F.	Heat losses from a 75 ton hot metal car. To be presented at May meeting of Am. Fdy. Assn.
490	LC 238	1928	Tuckerman, L.B., French, H.J., Gardner, I.C.	Martens' extensometer with Tuckerman optical lever system for high temperature tension testing.
491		1928	Wensel, H.T., Roeser, W.F.	Temperature measurements of molten cast iron. To be presented at May meeting of Am. Fdy. Assn.

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R 35	Steel lockers	5¢
R 36	Milling cutters	5¢
R 53	Steel spiral rods (for concrete reinforcement)	5¢
R 54	Sterling silver flat ware	5¢
R 55	Tin ware, galvanized, and Japanned ware	5¢
R 57	Wrought iron and wrought steel pipe valves and fittings	5¢
R 58	Classification of iron and steel scrap	5¢

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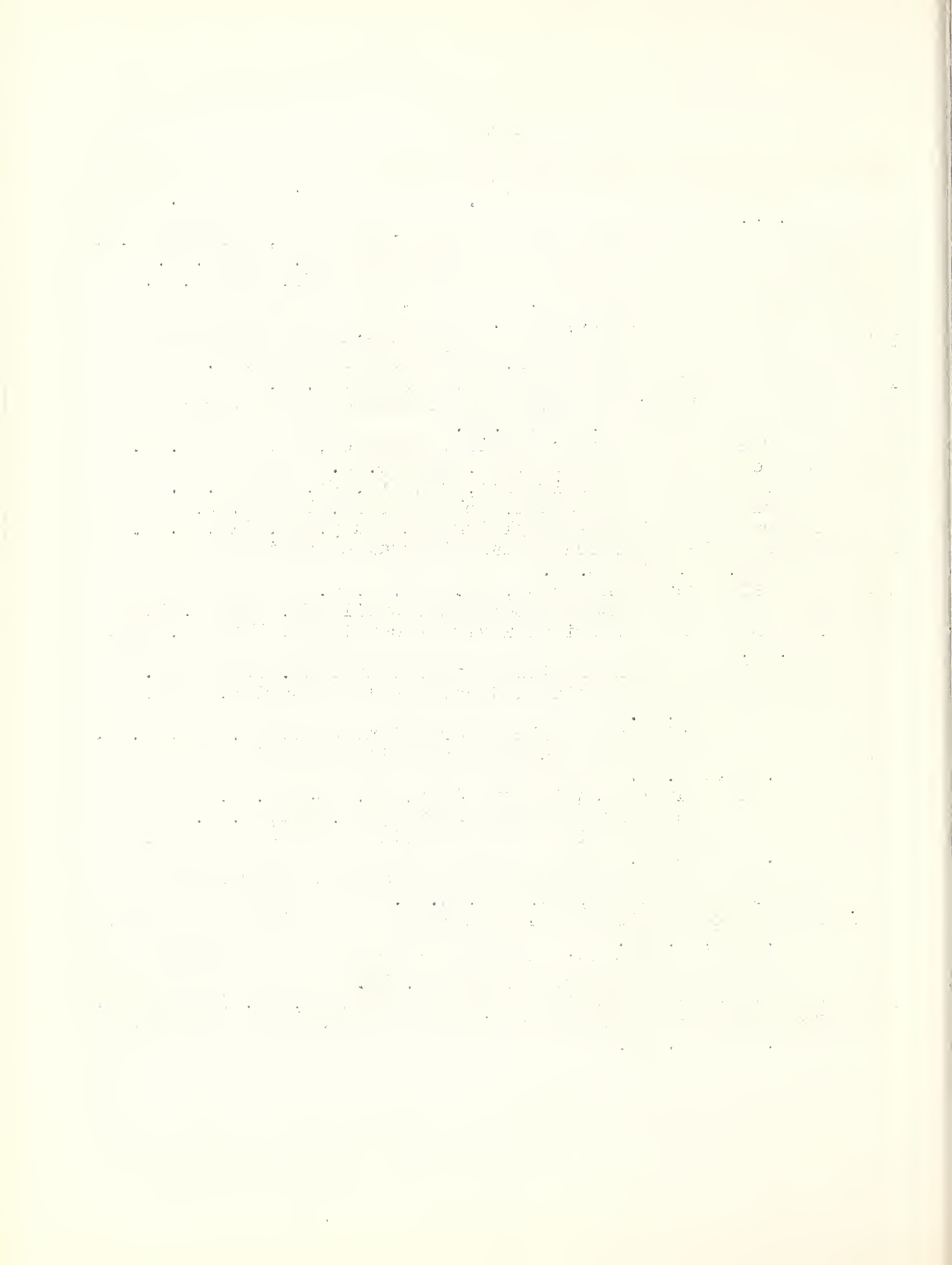
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- 1926 Tests of metals at high temperatures, March, No. 107, p. 3.
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- 1926 Compressive strength and deformation of structural steel and cast iron at temperatures up to 950°C, May, No. 109, p. 3.
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