Exhibit "C"

HOT-ROLLED STEEL—ANALYSES

COLOR MARKING

If color marking is to be done by the seller it must be shown on the order. The painting of Commercial grade steels will be done by the mills if buyer accepts the extra charge, and in consequence the painting of this class of material by the mills is not recommended. If Forging Quality, Guaranteed Forging Quality or Alloy Steel is ordered in coils or in sizes under one inch in cross-section (customarily bundled and tagged), it shall be painted by the seller on the tag or on the flat near the end of the bar except when one color only can be conveniently applied to one end of all bars in the bundle. In no case shall bundles be marked by applying one color to one end of the bundle and the second color to the other end, or by painting one end of the bundle with two colors disregarding the individual bar ends. After breaking bundles, buyer will paint individual bars as found necessary or advisable.

Paints used by all Works in accordance with this specification shall be the "One Stroke Marking Inks" bought from McCormick Works or mixed according to the standard formulae which may be obtained from the office of the Supervisor of Materials and Standards. Sellers are urged to make use of these inks, but other paints, provided they meet the standard shade and are satisfactory as to wearing qualities, may be substituted.

STEEL ANALYSES

Carbon (Open Hearth or Electric) Steels

The Following Lists of Chemical Analyses Comprise All Steels Used in Regular Production

Symbol	Carbon	Manganese	Phosphorus	Sulphur	Silicon
MD-1010	.05 – .15	.30 – .60	.045(max)	.05 (max)	.....
MD-1015	.10 – .20	.30 – .60	.045 "	.05 "	.....
MD-1016	.15 – .20	.70 –1.00	.045 "	.05 "	.....
MD-1019	.15 – .25	.60 – .90	.06 "	.075 – .15	.....
MD-1020	.15 – .25	.30 – .60	.045 "	.05 (max)	.....
MD-1025	.20 – .30	.50 – .80	.045 "	.05 "	.....
MD-1031	.25 – .35	.90 –1.20	.04 "	.05 "	.....
MD-1036	.33 – .40	.65 – .95	.045 "	.05 "	.08 – .15
MD-1040	.35 – .45	.50 – .80	.045 "	.05 "	.....
MD-1045	.40 – .50	.50 – .80	.045 "	.05 "	.....
MD-1050	.45 – .55	50 – .80	.045 "	.05 "	.....
MD-1060	.55 – .70	.50 – .80	.045 "	.05 "	.....
MD-1065	.60 – .75	.50 – .80	.045 "	.05 "	.....
MD-1068	.63 – .73	1.05–1.30	.03 "	.04 "	.10 – .25
MD-1071	.65 – .80	.70 –1.00	.045 "	.05 "	.....
MD-1080	.75 – .90	.35 – .65	.04 "	.05 "	.25(max)
MD-1086	.80 – .95	.75 –1.05	.045 "	.05 "	.....
*MD-1090	.80 – .95	.25 – .45	.03 "	.035 "	.10 – .25
MD-1091	.85 –1.00	.35 – .65	.04 "	.04 "	.10 – .25
MD-1092	.85 –1.00	.85 –1.00	.04 "	.05 "	.10 – .25
MD-1095	.90 –1.05	.25 – .50	.04 "	.05 "	.....
MD-10100	.95 –1.10	.25 – .45	.025 "	.03 "	.10 – .25
MD-10105	.95 –1.10	.45 – .65	.04 "	.04 "	.10 – .25

*When ordered for a purpose other than Knife Sections this steel will have a phosphorus specification of .045 (max.) and a sulphur specification of .05 (max.).

Carbon (Bessemer) Steels

	Carbon	Manganese	Phosphorus	Sulphur
*MD-1406	.05—.10	.30—.50	.11(max.)	.08(max.)
MD-1410	.08—.15	.30—.70	.11 "	.08 "
MD-1412	.08—.16	.60—.90	.11 "	.075–.15
*MD-1420	.15—.25	.50—.90	.11 "	.08(max.)
*MD-1434	.30—.40	.70–1.00	.11 "	.08 "
*MD-1435	.30—.40	.50—.90	.11 "	.08 "
*MD-1440	.35—.45	.50—.80	.11 "	.08 "
*MD-1442	.37—.47	.40—.60	.11 "	.08 "
*MD-1445	.40—.50	.50—.80	.11 "	.08 "

*The use of these steels should be discouraged when Open Hearth Steels of similar properties are available.

Alloy Steels—Nickel Group

Symbol	Carbon	Manganese	Phosphorus	Sulphur	Nickel
MD-2015	.10 – .20	.30 – .60	.04(max)	.05(max)	.40 – .60
MD-2115	.10 – .20	.30 – .60	.04 "	.05 "	1.25 – 1.75
*MD-2315	.10 – .20	.30 – .60	.04 "	.05 "	3.25 – 3.75
MD-2320	.15 – .25	.30 – .60	.04 "	.05 "	3.25 – 3.75
*MD-2330	.25 – .35	.50 – .80	.04 "	.05 "	3.25 – 3.75
MD-2335	.30 – .40	.50 – .80	.04 "	.05 "	3.25 – 3.75
MD-2340	.35 – .45	.50 – .80	.04 "	.05 "	3.25 – 3.75
MD-2345	.40 – .50	.50 – .80	.04 "	.05 "	3.25 – 3.75
MD-2350	.45 – .55	.50 – .80	.04 "	.05 "	3.25 – 3.75
*MD-2512	Max. .17	.30 – .60	.04 "	.05 "	4.75 – 5.25

Alloy Steels—Nickel Chromium Group

Symbol	Carbon	Manganese	Phosphorus	Sulphur	Nickel	Chromium
*MD-3115	.10–.20	.30–.60	.04(max)	.05(max)	1.00–1.50	.45– .75
MD-3120	.15–.25	.30–.60	.04 "	.05 "	1.00–1.50	.45– .75
MD-3125	.20–.30	.50–.80	.04 "	.05 "	1.00–1.50	.45– .75
MD-3130	.25–.35	.50–.80	.04 "	.05 "	1.00–1.50	.45– .75
MD-3135	.30–.40	.50–.80	.04 "	.05 "	1.00–1.50	.45– .75
MD-3140	.35–.45	.50–.80	.04 "	.05 "	1.00–1.50	.45– .75
MD-3144	.42–.47	.50–.80	.04 "	.05 "	1.00–1.50	.75–1.00
MD-3147	.45–.50	.50–.80	.04 "	.05 "	1.00–1.50	.75–1.00
MD-3215	.10–.20	.30–.60	.04 "	.05 "	1.50–2.00	.90–1.25
MD-3220	.15–.25	.30–.60	.04 "	.05 "	1.50–2.00	.90–1.25
MD-3230	.25–.35	.30–.60	.04 "	.05 "	1.50–2.00	.90–1.25
MD-3240	.35–.45	.30–.60	.04 "	.05 "	1.50–2.00	.90–1.25
MD-3245	.40–.50	.30–.60	.04 "	.05 "	1.50–2.00	.90–1.25
MD-3250	.45–.55	.30–.60	.04 "	.05 "	1.50–2.00	.90–1.25
MD-3312	Max. .17	.30–.60	.04 "	.05 "	3.25–3.75	1.25–1.75
MD-3325	.20–.30	.30–.60	.04 "	.05 "	3.25–3.75	1.25–1.75
MD-3335	.30–.40	.30–.60	.04 "	.05 "	3.25–3.75	1.25–1.75
MD-3340	.35–.45	.30–.60	.04 "	.05 "	3.25–3.75	1.25–1.75
MD-3415	.10–.20	.30–.60	.04 "	.05 "	2.75–3.25	.60– .95
MD-3435	.30–.40	.30–.60	.04 "	.05 "	2.75–3.25	.60– .95
MD-3450	.45–.55	.30–.60	.04 "	.05 "	2.75–3.25	.60– .95

(Tables continued on page 14)

Exhibit C, Article 7.

February 14, 1925. Section Three
Decision 4.

Official Material Specification.

Specification on - PHOSPHOR BRONZE

Works affected - ALL USING.

(a) This bronze is serviceable for bushings and as a bearing metal for high speeds and heavy pressures against a hardened steel surface.

It must be clean and sound, free from blow holes and excessive segregation.

(b) The chemical analysis shall be:-

	Min.		Max.	Desired.
Copper	78.0	to	81.5%	80.0%
Tin	9.0	to	11.0	10.0
Lead	9.0	to	11.0	10.0
Zinc			.50	
Iron			.25	

Phosphorus must be present.

(c) The following physical requirements are demanded:

Tensile strength, lbs. per sq. in.,	Minimum	25,000.
Yield Point, " " " "	"	12,000.
Elongation in two inches, per cent.	"	8.
Reduction of area, per cent	"	6.
Brinell hardness	"	52.

Pattern Maker's allowance for shrinkage, in. per ft. .125

(d) When purchased in ingot form the ingot shall be approximately 2-1/2" x 3" x 8" and weigh 20 to 30 lbs.

(e) The I.H.C. standard method of sampling and test or such method as approved shall be used.

(f) The identification mark on each pig shall be B-80-100.

NOTE: This supercedes decision #4, dated August 18, 1922.

Recommended by	Sub.Committee	A.P.Eves	Feb. 2, 1925.
Concurred in by	Materials Committee	O.B.Zimmerman,	Feb.2,1925.
Approved by	Experimental Dept.	E.A.Johnston,	Feb.14,1925.
	Manufacturing Dept.	J.G.Wood	Feb.5,1925.
	Purchasing Dept.	W.B.Edgar	Feb.3,1925.

Exhibit "C", Article 8,

February 14, 1925. Section Three
Deicison 9.

Official Material Specification.

Specification on - TIN-BASE BABBITT

Works Affected - ALL USING.

(a) The metal furnished under this specification is known generally as high pressure bearing metal or "Genuine Babbitt". It may be applied to all bearings used for lining connecting rods and main shaft bearings, which are subjected to high speeds, excessive pressure and "Wiping" actions.

It shall be clean sound metal, free from blow holes and excessive segregation.

(b) The chemical analysis shall be as follows:

	Min.	Max.	Desired.
Tin	88 to	90%	88.9%
Copper	3.4 to	4.	3.7
Antimony	7 to	8	7.4
Lead		.50	100.00
Iron		.08	
Arsenic		.10	
Zinc		None	
Aluminum		None	

(c) The Brinell hardness on this metal shall be not less than 28.

(d) This metal shall be cast into pigs which weigh approximately 40 lbs. These pigs shall have three notches equally spaced.

(e) The I.H.C. standard method of sampling and testing or such method as approved shall be used.

(f) The identification mark on each pig shall be BA 90-070.

NOTE:- This specification supercedes Decision #9, dated August 18,1922.

Recommended by	Sub-Committee	A.P. Eves	Feb. 2, 1925.
Concurred in by	Materials Committee	O. B. Zimmerman,	Feb. 2, 1925.
Approved by	Experimental Dept.	E. A. Johnston	Feb. 14, 1925.
A	Manufacturing Dept.	J. G. Wood	Feb. 5, 1925.
	Purchasing Dept.	W. B. Edgar	Feb. 3, 1925.

Exhibit "C", Article 9.

February 14, 1925 Section Three
Decision 1

Official Material Specification.

Specification on - RED BRASS.

Works affected - ALL USING.

(a) This analysis applies to metal in the ingot form. In the future ingots shall be purchased instead of scrap brass.

This is the standard metal for brass castings. It shall be clean and sound, free from blow holes and excessive segregation.

(b) The chemical analysis shall be as follows:

	Min.	Max.	Desired.
Copper	83.00 to	86.00%	85.00%
Tin	4.50 to	5.50	5.00
Lead	4.50 to	5.50	5.00
Zinc	4.50 to	5.50	5.00
Iron		.25	
Antimony		.25	
Aluminum		None	

(c) The following physical requirements are demanded.

Ultimate strength, lbs. per sq. in.,	Minimum	27,000
Yield point, " " " "	"	12,000
Elongation in 2 in., per cent	"	16.

(d) The ingot shall be approximately 2-1/2" x 3" x 8" and weigh 20 to 30 lbs.

(e) The I.H.C. standard method of sampling and testing or such method as approved shall be used.

(f) The identification mark on each pig shall be B 85-050.

NOTE:- This specification supercedes Decision #1, dated August 18, 1922.

Recommended by	Sub.Committee	A.P.Eves	Feb. 2, 1925.
Concurred in by	Materials Committee	O.B.Zimmerman	Feb. 2, 1925.
Approved by	Experimental Dept.	E.A.Johnston	Feb. 14, 1925
	Manufacturing Dept.	J.G.Wood	Feb. 5, 1925.
	Purchasing Dept.	W.B.Edgar	Feb. 3, 1925.