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THE MORE CAPITAL PRODUCES THE RICHER IT IS — A NATION THAT MANUFACTURES FOR ITSELF PROSPERS

DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION.

VOL. 53. TORONTO, OCTOBER 5, 1906. No. 7.

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DEVOTED TO THE MANUFACTURING INTEREST OF THE DOMINION

ESTABLISHED IN 1880.

PUBLISHED ON THE FIRST AND THIRD FRIDAYS OF EACH MONTH

The Canadian Manufacturer Publishing Co., Limited.
McKinnon Building, Cor. Melinda and Jordan Sts., Toronto.

J. J. CASSIDEY, - - - Editor.
D. O. McKINNON, - - - Business Manager.

Montreal:—E. J. Chave, 242 Bleury St.
London, Eng.:—H. Crankshaw, 101 Leadenhall St., E.C.

Cable address: "CANAMAN." Western Union Telegraphic Code used.

SUBSCRIPTIONS:

Canada and United States $1.00 per year. All other Countries in Postal Union ten shillings sterling, including postage.

BRITISH EXPORTS AND CANADIAN IMPORTS OF TEXTILES.

In the following pages is given in detail the value and destination of exports of textile fabrics made in Great Britain in the years 1901 and 1905; also the value of all dutiable textile fabrics imported for consumption into Canada from Great Britain, United States and all countries in the years 1901 and 1906; also the value of non-dutiable fabrics and other similar raw materials used in the textile industries in Canada coming from Great Britain, United States and all countries in the last named years. The British official returns enumerate only 61 different articles, as shown, while the Canadian official enumeration of dutiable imports includes 114 different articles, the list of free imports mentioning 24 different articles.

The total value of British textile exports in 1901 was $548,361,001 and in 1905, $675,422,048, an increase of $127,061,047, or 23.1 per cent., the exports to Canada being $19,057,443 in 1901, and $27,453,743 in 1905, an increase of $8,396,300, or 43 5 per cent.

According to Canadian returns the value of imports from Great Britain of dutiable textiles in 1901 under the preferential tariff was $11,561,053, increased in 1906 to $22,740,060, an increase of $11,188,007, or 96.7 per cent., the increase in such imports from the United States being from $2,872,694 in 1901 to $7,785,004 in 1906, an increase of $1,912,310, or 66.5 per cent., the increase from all countries being from $20,821,558 in 1901 to $38,502,672 in 1906, say $17,681,114, or 84.9 per cent.

Our free imports from Great Britain in 1901 were valued at $798,418, and in 1906 at $1,443,903, an increase of $645,485, or 80.0 per cent.; from the United States in 1901 at $6,413,200, and in 1906, $10,535,799, an increase of $4,122,599, or 64.2 per cent.

It will be observed that there are some differences in the values shown between the exports of British textiles to Canada, according to the British returns, and the Canadian imports of British goods from that country according to the Dominion returns, the Canadian valuations being considerably less than the British, thus:

Exports to Canada. British returns.		British Imports Canadian returns.	
1901.	$19,057,443	1901.....	$11,561,053
1905.	27,453,743	1906.....	22,749,060
Increase....	8,396,300	Increase...	11,188,007

Some of the notable increases in value of textiles from Great Britain under the preferential tariff in the years named include twines, n.e.s., cotton clothing, cotton socks and stockings, curtains and shams, cotton laces, flax damasks, flax duck and unfinished jute cloth, hats and caps of silk or felt, jute mats and rugs, oil cloth and linoleum, silk underclothing, woolen goods—blankets, cassimeres, coatings, tweeds, felts, knitted underwear, bed comforts, socks and stockings, wool yarns for factories, women's dress goods, tapestry, carpets and wool shoddy.

It will be noticed that the value of non-dutiable fabrics and other raw materials used in the textile industries in Canada, imported from Great Britain in 1906, amounted to $1,443,903, which was an increase of $645,485 over 1901, while the imports of similar materials from the United States in 1906 amounted to $10,535,799, an increase of $4,122,599 over 1901. Canada imported from the United States in 1906 more than $9,000,000 worth of such raw material than from Great Britain.

The total value of the import and export trade of Great Britain in the years 1901 and 1905 was as under, Compiled for THE CANADIAN MANUFACTURER from British official documents.

Value of the total imports of merchandise into Great Britain:

	1901.	1905.
From Foreign Countries..	£175,148,555	£216,378,803
From British Possessions..	104,873,821	113,437,811
Total..	£280,022,376	£329,816,614

Value of the total exports of produce and manufactures of the United Kingdom:

	1901.	1905.
To Foreign Countries...	£175,148,555	£216,378,803
To British Possessions.	104,873,821	113,437,811
Total....	£280,022,376	£329,816,614

Value of the total imports and exports of all merchandise:

	1901.	1905.
From and to Foreign Countries.....	£650,961,399	£722,034,798
From and to British Possessions.....	218,893,067	250,581,646
Total.....	£869,854,466	£972,616,444

BRITISH EXPORTS OF TEXTILES.

Value and Destination of Exports in 1901 and 1905 of Textile Fabrics made in the United Kingdom.

Compiled by the CANADIAN MANUFACTURER from the Official Annual Statements of the Trade of the United Kingdom with Foreign Countries and British Possessions.

TOTAL EXPORTS.

		All Countries.	Canada.	All British Possessions.	United States.	All Foreign Countries.
Apparel, not water-proofed..	1901	£5,571,259	£281,100	£4,841,359	£74,752	£729,100
	1905	227,893	15,113	101,979	Not enumerated	125,914
Apparel, wool or mixed, not water-proofed.	1901	Not enumerated	Not enumerated	Not enumerated	Not enumerated	Not enumerated
	1905	2,323,115	173,646	1,918,014	19,317	405,101
Apparel, other material not water-proofed	1901	Not enumerated	Not enumerated	Not enumerated	Not enumerated	Not enumerated
	1905	2,219,956	92,821	1,919,279	37,306	300,677
Cotton yarn for weaving, grey	1901	6,110,852	52,701	944,663	192,296	5,166,189
	1905	8,223,400	32,566	1,075,591	288,627	7,147,809
Cotton yarn, bleached and dyed	1901	1,866,180	11,782	1,042,170	81,722	824,010
	1905	2,095,154	26,547	1,203,077	118,082	891,447
Cotton piece goods, grey.	1901	18,309,323	64,433	11,428,575	148,674	6,880,748
	1905	21,933,398	29,028	12,862,552	113,377	9,070,816
Cotton piece goods, white.	1901	15,698,946	83,200	7,899,985	343,262	7 798,961
	1905	19,033,712	178,349	7,910,115	516,488	11,123,597
Cotton goods, printed.	1901	10,349,455	195,953	4,221,924	135,374	6,127,531
	1904	12,556,710	244,824	5,270,793	106,541	7,285,919
Cotton goods, dyed	1901	12,143,003	280,436	4,394,784	770,327	7,748,219
	1905	17,276,482	402,914	5,521,026	1,314,655	11,755,456
Cotton lace and net.	1901	2,666,819	239,395	660,321	1,067,419	2,006,498
	1905	3,736,908	302,995	812,685	969,410	2,018,223
Cotton hosiery, stockings, etc..	1901	222,637	5,648	197,981	8,028	24,656
	1905	157,028	4,532	131,897	7,980	25,131
Cotton hosiery, other kinds	1901	197,345	39,925	135,559	19,537	61,786
	1905	360,828	71,902	280,742	15,374	80,086
Cotton sewing thread..	1901	3,590,989	88,225	508,655	11,270	3,082,334
	1905	3,381,922	112,039	575,700	16,240	2,806,222
Cotton goods unenumerated	1901	2,529,108	105,284	1,125,381	127,044	1,403,727
	1905	3,240,623	156,850	1,287,699	173,824	1,952,927
Haberdashery.	1901	1,460,316	125,401	1,235,481	22,118	224,835
	1905	1,265,603	202,892	1,039,005	19,165	226,598
Hats and bonnets, felt.	1901	812,533	120,405	469,646	7,323	342,887
	1905	761,638	135,040	376,882	11,931	384,756
Jute yarn.	1901	514,603	Not enumerated	8,383	9,623	506,220
	1905	600,772	Not enumerated	9,461	31,924	591,311
Jute piece goods.	1901	2,143,730	157,573	336,126	1,123,734	1,807,604
	1905	1,978,146	206,482	335,530	1,101,604	1,642,616
Jute, other manufactures of.	1901	69,803	1,219	36,154	1,430	33,649
	1905	99,932	3,036	33,703	4,568	66,229
Linen yarn.	1901	824,681	3,478	12,442	41,746	812,239
	1905	927,617	15,182	24,233	58,533	903,384
Linen piece goods plain	1901	3,242,487	163,756	550,299	1,903,730	2,692,188
	1905	4,225,394	221,160	663,179	2,384,543	3,562,215
Linen piece goods, printed, damask, drapier, etc.	1901	240,375	11,834	59,950	23,521	180,416
	1905	335,635	11,043	72,286	30,877	263,349
Linen sail cloth.	1901	254,212	None	132,122	4,549	122,090
	1905	280,840	None	102,859	4,917	177,981
Linen sewing thread..	1901	227,119	30,456	82,786	30,223	144,333
	1905	262,396	28,672	83,928	36,115	178,468
Linen goods, unenumerated	1901	1,056,306	56,330	275,003	578,201	781,303
	1905	1,236,951	84,538	293,611	656,078	943,340
Oil and floor cloth.	1901	1,298,007	69,808	520,864	118,388	777,143
	1905	1,752,005	127,586	624,780	254,469	1,127,225
Silk twist or yarn.	1901	294,311	1,151	294,311	73,774	212,468
	1905	285,705	5,221	61,784	95,968	223,921
Silk and satin broadstuffs	1901	492,297	21,375	70,272	35,388	422,025
	1905	798,727	19,720	56,227	35,849	742,500
Silk handkerchiefs, etc	1901	181,452	6,985	132,546	5,996	48,906
	1904	138,271	3,110	89,059	6,811	19,212
Silk ribbons, all kinds.	1901	27,590	9,383	23,124	695	4,456
	1904	14,973	2,078	10,083	360	4,890

TOTAL EXPORTS—(Continued.)

		All Countries.	Canada.	All British Possessions.	United States.	All Foreign Countries.
Silk lace and manufactures of	1901	£98,772	£2,556	£15,950	£31,046	£82,822
	1905	72,761	11,185	17,288	19,784	55,476
Silk unenumerated	1901	185,429	6,106	84,097	12,109	101,332
	1904	287,914	12,985	117,267	77,976	170,047
Silk mixed, broadstuffs	1901	376,837	57,152	124,160	81,665	252,677
	1905	406,006	87,304	135,188	29,837	270,818
Silk mixed, other kinds	1901	67,001	7,967	20,002	36,800	47,002
	1905	318,037	21,827	174,389	20,020	143,648
Woolen yarn	1901	92,090	7,952	34,510	992	57,580
	1905	188,693	27,312	64,127	1,221	124,566
Worsted yarn	1901	3,395,596	31,483	68,634	1,573	3,326,962
	1905	4,055,256	143,391	200,402	3,912	3,854,854
Alpaca and mohair yarn	1901	1,599,983	Not enumerated	166	Not enumerated	1,599,817
	1905	1,690,647	Not enumerated	527	Not enumerated	1,690,120
Hair or wool yarn, n.e.s.	1901	150,978	Not enumerated	383	Not enumerated	150,595
	1905	238,645	Not enumerated	907	Not enumerated	237,738
All wool tissues, broad	1901	2,026,055	113,700	384,547	216,992	1,641,508
	1905	4,475,815	266,235	1,215,364	266,792	3,260,451
Woolen tissues, mixed, broad	1901	1,269,922	220,169	360,529	14,904	969,393
	1905	1,676,814	288,857	468,503	23,016	1,208,311
All wool tissues, narrow	1901	71,294	7,909	27,921	16,399	43,373
	1905	81,571	9,614	23,809	6,171	57,762
Woolen tissues, mixed, narrow	1901	31,128	1,483	15,647	1,338	15,481
	1905	28,581	2,838	14,887	1,088	13,694
All wool tissues, light, broad	1901	928,886	35,675	242,168	63,050	686,718
	1905	1,357,772	44,480	319,627	40,822	1,038,145
Woolen tissues mixed, light, broad	1901	529,733	28,956	189,592	4,208	340,141
	1905	990,609	150,932	433,379	10,061	557,230
All wool tissues, light, narrow	1901	179,555	6,561	65,463	11,613	114,092
	1905	175,735	3,121	57,795	4,287	117,940
Woolen tissues mixed, light, narrow	1901	162,501	15,418	83,481	2,379	79,020
	1905	375,651	46,637	173,288	10,117	202,363
All wool coatings, broad	1901	1,794,337	166,421	692,990	165,569	1,101,347
	1905	2,107,679	309,929	818,437	161,587	1,289,242
Woolen coatings mixed	1901	647,501	160,371	342,470	11,843	305,031
	1905	712,001	120,065	278,327	8,455	433,677
All wool coatings narrow	1901	78,284	9,541	39,711	21,941	38,573
	1905	113,758	57,259	83,022	11,276	30,736
Worsted coatings mixed, narrow	1901	88,892	8,579	37,620	4,175	51,272
	1905	75,815	23,725	44,116	5,103	31,699
Wool linings, etc	1901	544,938	26,760	230.059	49,174	314,879
	1905	478,890	51,508	220,824	45,491	258,066
Worsted stuffs mixed	1901	2,692,044	309,670	826 628	394,986	1,865,416
	1905	3,175,340	359,382	823,272	1,109,535	2,352,068
Damasks, furniture stuffs	1901	35,371	2,017	14,815	2,412	20,556
	1905	30,030	3,709	14,249	7,409	15,781
Wool and mohair plushes	1901	11,175	614	3,309	437	7,866
	1905	24,737	1,328	4,045	11,492	20,692
Flannels	1901	351,398	7,270	313,745	10,436	37,653
	1905	326,049	13,382	261,485	11,629	64,564
Carpets, not rugs	1901	829,947	224,969	405,938	50,186	424,009
	1905	976,459	311,203	537,161	53,426	439,298
Blankets	1901	297,123	3,764	248,047	Not enumerated	49,076
	1905	376,482	14,669	281,513	Not enumerated	94,969
Shawls	1901	88,070	7,498	69,942	1,283	18,128
	1905	67,236	8,438	52,538	2,818	14,698
Rugs, coverlets, etc	1901	443,833	9,972	320,162	8,566	123.671
	1905	448,775	22,247	283,308	17,938	165,467
Woolen hosiery	1901	893,335	175,281	697,445	49,793	195,890
	1905	1,190,601	289,711	948,811	53,335	241,790
Woolen smallwares, unenumerated	1901	242,046	21,123	99,377	16,881	142,669
	1905	330,267	19,160	126,660	34,852	203,607
Totals	1901	£112,259,795	£3,913,233	£47,700,974	£8,253,294	£65,131,370
	1905	138,690,359	5,637,319	52,942,874	10,480,402	85,637,467

RECAPITULATION.

TOTAL BRITISH TEXTILE EXPORTS.

British Currency.		Canadian Currency.	
1901	£112,259,795	1901	$548,361,001
1905	138,690,359	1905	675,422,048
Increase	26,430,564	Increase	127,061,047

Percentage of increase 23.1 per cent.

EXPORTS TO CANADA.

1901	£3,913,233	1901	$19,057,443
1905	5,637,319	1905	27,453,743
Increase	1,724,086	Increase	8,396,300

Percentage of increase 43.5 per cent.

ALL BRITISH POSSESSIONS.

1901	£47,700,974	1901	$232,303,742
1905	53,166,795	1905	258,922,291
Increase	5,465,821	Increase	26,618,549

Percentage of increase 11.4 per cent.

TO UNITED STATES.

1901	£8,253,294	1901	$40,193,541
1905	10,480,402	1905	51,039,557
Increase	2,227,108	Increase	10,846,016

Percentage of increase 26.9 per cent.

TO ALL FOREIGN COUNTRIES.

1901	£65,131,370	1901	$317,189,771
1905	85,637,467	1905	417,054,463
Increase	20,506,097	Increase	99,864,692

Percentage of increase 31.1 per cent.

CANADIAN IMPORTS OF TEXTILES.

Value of all Dutiable Textile Fabrics imported for consumption into Canada from Great Br tain, United States and all countries in the fiscal years 1901 and 1906.

Compiled by THE CANADIAN MANUFACTURER from the Trade and Navigation Tables of the Dominion of Canada.

	General Tariff.	Great Britain under Preferential Tariff.		United States under General Tariff.		All Countries.	
		1901.	1906.	1901.	1906.	1901.	1906.
Canvas for boats' sails	5 p.c.	$2,272	$7,655	$93	None	$2,896	$7,655
Church vestments	20 p.c.	234	1,496	407	$2,524	11,691	23,501
Cloths for water-proof clothing	15 p.c.	55,093	23,153	121	None	55,479	23,153
Cocoa carpeting, rugs, etc	25 p.c.	92,625	3,692	3,652	None	111,043	4,089
Cordage, cotton	25 p.c.	1,450	12,107	14,156	8,351	15,653	21,279
Cordage, twines, n.e.s	25 p.c.	27,924	155,305	48,612	82,998	78,383	240,952
Cotton, batts and batting	25 p.c.	427	683	9,926	9,926	10,437	16,026
Cotton, knitting yarns	25 p.c.	18,797	16,289	8,270	28,461	27,270	45,615
Cotton warps, n.e.s	25 p.c.	2,577	1,003	4,131	1,238	6,708	1,241
Cotton sewing thread on spools	25 p.c.	131,239	157,071	112,020	178,402	261,125	357,016
Cotton sewing thread in hanks	15 p.c.	376,764	383,887	83	222	377,781	384,109
Cotton sewing thread, all other, n.e.s	25 p.c.	1,913	211	1,538	313	3,455	524
Cotton crochet thread	25 p.c.	3,883	11,455	11,334	9,439	15,585	20,959
Cotton thread, all other, n.e.s	25 p.c.	1,913	211	1,538	313	3,455	524
Cotton seamless bags	20 p.c.	704	5,376	8,200	7,104	9,275	18,362
Cotton sheets and quilts	30 p.c.	1,433	176,420	1,614	17,831	3,203	202,904
Cotton shirts	35 p.c.	20,021	55,959	21,573	107,537	45,794	173,202
Cotton clothing, n.e.s	35 p.c.	88,030	232,894	190,107	370,052	314,926	673,319
Cotton blouses and waists	35 p.c.	834	4,810	14,218	79,057	15,514	87,726
Cotton bags, n.o.p	35 p.c.	510	7,080	29,790	56,385	30,591	63,523
Cotton lampwick	25 p.c.	1,115	5,143	7,021	5,398	9,053	10,876
Cotton shawls	30 p.c.	1,703	1,713	94	11	1,926	1,881
Cotton socks and stockings	35 p.c.	39,098	104,633	3,479	25,540	91,391	314,495
Cotton tape, not dyed	25 p.c.	24,635	46,805	2,494	10,222	29,549	62,521
Cotton tape, dyed or colored	35 p.c.	16,730	18,186	3,179	5,432	25,489	32,521
Cotton towels	30 p.c.	24,746	94,721	1,343	957	27,355	97,557
Cotton undershirts and drawers	35 p.c.	1,561	13,223	4,185	70,564	7,929	100,024
Cotton, uncolored, scrims, lawns, etc	25 p.c.	115,894	160,868	6,472	7,953	133,586	186,831

CANADIAN IMPORTS OF TEXTILES -(Continued).

	General Tariff.	Great Britain under Preferential Tariff.		United States under General Tariff.		All Countries.	
		1901.	1906.	1901.	1906.	1901.	1906.
Cotton velvets and plush, n.e.s.	30 p.c.	$212,909	$315,218	$37,824	$75,891	$206,570	$470,219
Cotton, other fabrics, n.o.p.	35 p.c.	20,557	53,605	43,041	112,799	73,517	199,435
Cotton crapes, black...	20 p.c.	18,989	9,986	502	173	24,438	13,303
Cuffs of cotton, linen, etc..	35 p.c.	777	851	466	724	1,301	5,150
Curtains and shams..	35 p.c.	274,506	101,347	55,443	75,248	136,950	634,191
Embroideries, n.o.p..	35 p.c.	9,717	12,053	6,905	8,364	56,579	84,982
Braids, cords, fringes, etc...	35 p.c.	57,225	71,831	103,753	122,112	389,753	454,754
Flowers, artificial....	25 p.c.	47,909	62,176	58,920	85,242	141,488	264,808
Lace, lace netting, etc....	35 p.c.	373,230	745,823	31,977	76,687	799,219	1,702,897
Flax or hemp bags....	20 p.c.	43,172	10,660	10,570	34,824	58,646	117,250
Flax carpeting....	25 p.c.	92,625	61,579	3,652	3,179	111,043	92,113
Flax linings and pads....	25 p.c.	674	646	157	4,652	874	5,307
Flax sail twine....	5 p.c.	4,856	2,646	44	72	5,207	2,763
Flax damask, n.o.p....	30 p.c.	389,673	601,167	11,140	9,675	454,919	721,468
Flax handkerchiefs..	35 p.c.	136,293	190,814	1,355	1,502	169,936	216,192
Flax horse clothing....	30 p.c.	78	1,049	6,806	1,127	6,986	2,176
Flax towels....	30 p.c.	121,849	166,327	844	821	133,611	179,815
Flax sheets and sheeting..	30 p.c.	749	1,599	30	1	850	2,050
Flax, linens, brown or bleached....	25 p.c.	62,292	71,347	2,270	75	66,805	73,134
Flax, duck, canvas, etc., n.e.s	25 p.c.	487,199	612,578	15,840	28,644	516,424	689,942
Flax, linen clothing..	35 p.c.	11,608	9,347	2,444	4,053	16,059	14,933
Flax, linen blouses and shirt waists...	35 p.c.	None	110	35	116	35	931
Flax, linen thread....	25 p.c.	147,439	163,923	1,289	3,145	153,675	167,808
Flax, linen shirts....	35 p.c.	3,223	2,759	2,292	2,071	6,789	5,126
Flax and jute yarns, n.e.s....	25 p.c.	80	2,085	514	638	594	2,723
Flax and jute cloth—unfinished...	10 p.c.	41,821	260,099	232	6,882	46,290	556,845
Flax, other articles, n.o.p...	35 p.c.	3,002	5,963	3,550	4,565	9,838	15,049
Flax, other articles, n.e.s..	25 p.c.	145,384	192,901	8,598	13,448	159,653	214,688
Clothing....	35 p.c.	88,030	33,445	190,107	16,717	314,926	40,524
Hose—fire, lined....	35 p.c.	766	935	53,095	50,173	54,409	51,262
Rubber packing, mats, etc....	35 p.c.	932	1,364	39,617	67,795	40,759	72,215
Rubber, all other, n.o.p.	25 p.c.	26,482	56,317	179,693	321,006	235,160	414,493
Hats and caps, silk or felt..	30 p.c.	584,398	684,642	475,718	564,624	1,076,004	1,290,538
Hats and caps, straw, n.e.s.	30 p.c.	253,968	330,946	252,187	518,875	547,971	933,365
Knitted goods, n.e.s....	35 p.c.	2,420	1,355	893	448	4,638	1,939
Mats and rugs, jute, n.e.s...	35 p.c.	92,625	263,834	3,652	27,254	111,043	363,997
Oiled silk and cloth—flocked or coated n.o.p....	30 p.c.	25,804	19,241	52,845	156,477	79,942	177,442
Oil cloth and linoleum..	30 p.c.	309,441	707,899	24,446	26,730	340,888	737,646
Regalia and badges....	35 p.c.	502	1,962	5,499	8,762	6,214	10,422
Ribbons....	35 p.c.	27,012	11,225	34,156	79,342	617,197	1,150,332
Railway rugs and dusters, etc..	30 p.c.	53,331	36,415	15,730	9,197	113,184	51,578
Sails for boats and ships....	25 p.c.	303	622	1,279	1,934	2,149	2,696
Silk fabrics....	30 p.c.	320,203	363,991	105,640	93,024	2,359,753	3,882,554
Silk cloth for undertakers.	10 p.c.	Not enumerated	43	Not enum'ted	742	Not enum'ted	17,983
Silk for neckties, etc...	10 p.c.	Not enumerated	66,110	Not enum'ted	105,942	Not enum'ted	500,938
Silk handkerchiefs....	35 p.c.	32,699	29,117	912	1,660	116,315	129,933
Silk blouses and waists..	35 p.c.	2,694	27,881	9,902	15,393	13,185	54,872
Silk clothing....	35 p.c.	117,695	148,468	65,714	33,207	244,661	248,210
Silk in the gum or spun..	15 p.c.	3,381	30,286	2,479	2,752	6,181	33,038
Silk, sewing or embroidery.	25 p.c.	15,419	23,206	9,720	15,297	25,789	39,912
Silk shawls....	30 p.c.	349	1,405	174	917	2,286	8,702
Silk shirts....	35 p.c.	485	2,036	339	3	834	2,903
Silk goods, n.o.p., n.e.s....	35 p.c.	35,329	32,815	15,667	18,228	95,262	114,176
Silk socks and stockings....	35 p.c.	1,463	4,796	None	283	1,766	8,755
Silk undershirts and drawers..	35 p.c.	27	5,905	175	81	1,229	6,549
Silk velvets, n.e.s....	30 p.c.	113,822	142,910	10,718	11,197	238,287	283,257
Stockinettes for shoemakers.	15 p.c.	11,819	14,112	39,820	58,522	51,639	72,634
Carpets, n.e.s.	35 p.c.	118,848	790	3,713	None	133,944	879
Carpeting, and matting straw...	25 p.c.	992	113	1,598	7,032	39,994	47,078
Tape lines....	25 p.c.	4,031	11,273	3,738	16,252	8,253	28,446
Twine for hammocks, nets, etc....	30 p.c.	3,108	1,548	11,153	31,035	15,257	33,527
Webbing.	20 p.c.	51,472	61,740	82,773	134,710	139,802	143,586
Window shades, n.e.s....	35 p.c.	728	7,370	348	4,443	1,089	12,095
Wool blankets....	35 p.c.	29,128	98,669	5,311	4,928	35,222	111,490
Wool cassimeres....	35 p.c.	2,587	1,853,932	48	9,205	6,812	1,977,209
Wool coatings....	35 p.c.	496,212	1,116,122	984	10	505,813	1,164,929
Wool tweeds....	35 p.c.	732,010	2,008,409	538	282	786,448	2,073,726
Wool felt cloth, n.e.s....	35 p.c.	6,627	10,973	41,138	18,281	50,301	32,588

CANADIAN IMPORTS OF TEXTILES—(Continued).

	General Tariff.	Great Britain under Preferential Tariff.		United States under General Tariff.		All Countries.	
		1901.	1906.	1901.	1906.	1901.	1906.
Wool flannels	35 p.c.	$51,296	$93,429	$4,966	$1,424	$123,435	$131,674
Wool, knitted underwear, n.e.s.	35 p.c.	54,498	258,100	11,080	49,535	94,012	401,027
Wool, bed comforters	35 p.c.	827	13,286	604	2,274	1,718	16,027
Wool shawls	30 p.c.	69,546	77,544	1,688	1,370	93,664	109,118
Wool shirts	35 p.c.	12,368	25,566	1,815	3,728	17,009	31,065
Wool socks and stockings	35 p.c.	479,189	1,012,426	7,903	15,777	543,012	1 119,281
Wool undershirts and drawers	35 p.c.	79,870	155,989	12,944	43,957	103,821	222,175
Wool yarns for factories	20 p.c.	177,743	745,008	2,499	1,635	244,277	762,586
Wool yarns, n.e.s.	30 p.c.	86,967	102,892	4,912	710	134,654	151,545
Wool, all other fabrics, n.e.s.	35 p.c.	1,928,843	4,107,222	44,273	55,562	3,098,818	5,965,648
Wool, women's dress goods, etc.	25 p.c.	28,405	63,369	1,116	None	55,182	88,281
Wool, women's clothing	35 p.c.	Not enumerated	141,231	Not enum'ted	102,685	Not enum'ted	190,531
Wool, ready-made clothing, n.e.s.	35 p.c.	371,760	377,999	164,596	262,316	952,812	789,516
Wool carpets—Brussels	35 p.c.	407,302	460,335	3,709	1,554	417,133	468,022
Wool carpets—tapestry	35 p.c.	458,937	560,093	4,669	587	475,683	564,599
Wool, n.e.s.	35 p.c.	Not enumerated	515,439	Not enum'ted	3,362	Not enum'ted	541,694
Wool felt not filled	20 p.c.	21,221	18,955	40,865	40,893	182,550	195,515
Wool shoddy	20 p.c.	3,178	39,914	393	552	3,571	40,703
Totals		$11,561,053	$22,749,060	$2,872,694	$4,785,004	$20,821,558	$38,502,672

Increase from Great Britain under preferential tariff, $11,188,007, 96.7 per cent.
Increase from United States under general tariff, $1,912,310, 66.5 per cent.
Increase from all countries, $17,681,114, 84.9 per cent.

FREE IMPORTS.

Following is the value of non-dutiable fabrics and other raw materials used in the textile industries for consumption in Canada coming from Great Britain, United States and all countries in the fiscal years 1901 and 1906.
Compiled from the Dominion Trade and Navigation Tables.

	Great Britain.		United States.		All Countries.	
	1901.	1906.	1901.	1906.	1901.	1906.
Silk—raw	Not enumerated	Not enum'ted	$261,637	$425,446	$261,637	$451,707
Silk in the gum	Not enumerated	$222	924	1,051	924	1,273
Flax—fibre	Not enumerated	3,463	834	2,515	834	5,978
Vegetable fibres, n.e.s.	$1,902	1,677	22,390	24,766	24,519	28,337
Binder twine	Not enumerated	21,818	928,096	1,628,923	928,096	1,650,741
Bolting cloth	36	97	6,387	17,034	6,709	17,593
Bookbinders' cloth	13,668	26,424	17,010	16,005	31,887	44,443
Buckram for hats	2,240	2,621	1,675	6,612	4,174	11,783
Canvas for bicycle tires	1,720	Not enum'ted	17,259	17,125	18,979	17,125
Coir and coir yarn	None	428	2,667	13,495	2,667	13,923
Cotton waste	16,461	72,722	250,913	528,832	267,431	613,100
Cotton—raw	28,916	1,185	4,731,812	7,596,729	4,773,993	7,626,625
Duck for belting and hose	37	168	102,279	118,169	102,316	118,337
Hatter's plush	457	739	2,224	1,227	2,681	2,970
Jute cloth	620,667	619,673	15,330	27,036	663,752	843,859
Jute yarn	89,906	258,807	43,210	32,085	133,428	290,892
Mohair lastings for buttons	77	271	208	2,184	1,145	5,326
Yarn—botany	Not enumerated	91,810	Not enum'ted	None	Not enum'ted	91,810
Yarn, cotton No. 40	Not enumerated	304,979	Not enum'ted	70,922	Not enum'ted	382,017
Yarn for shoe laces	Not enumerated	Not enum'ted	Not enum'ted	1,499	Not enum'ted	6,136
Yarn, jute for towels	Not enumerated	14,170	Not enum'ted	258	Not enum'ted	14,428
Yarn, mohair	579	1,243	50	157	755	1,400
Yarn, alpaca for braid	3,160	63	310	Not enum'ted	3,470	449
Yarn, wool for tassels	18,392	21,323	7,985	3,709	26,377	25,042
Totals	$798,418	$1,443,903	$6,413,200	$10,535,799	$7,255,794	$12,265,285

Increase from Great Britain, $645,485. 80.0 per cent.
Increase from United States, $4,122,599. 64.2 per cent.
Increeease from All Countries, $5,009,491. 67.0 per cent.

EDITORIAL NOTES.

Canada's imports for the two months ended August 31, 1906, amounted to $51,187,578, and the exports of domestic products to $40,600,109, an increase of $8,501,313, and of $6,647,784, respectively, and a total betterment of $15,149,097 over the same months of the previous year. Forest products offer the best showing among the exports, the total shipments being $16,573,447 a gain of over three millions of dollars. The exports of animals and their products reached the respectable total of $4,793,606, a gain of $2,200,000. In none of the totals given are coin and bullion included. The following is a comparative statement of imports and exports for the two months:

	1905.	1906.
Dutiable goods..	$26,640,998	$30,679,475
Free goods..	16,045,267	20,508,103
Total.	$42,686,265	$51,187,578
Duty collected..	7,160,179	7,906,922
Exports:		
Products, mine...	$5,451,250	$4,691,141
Fisheries.	1,914,285	1,913,726
Forest.	7,223,995	8,928,207
Animals and produce...	13,493,142	16,573,447
Agriculture.	2,593,553	4,793,606
Manufactures.	3,262,180	3,658,093
Miscellaneous.	13,920	41,889
Total.	$33,952,325	$40,600,109

Mr. Alex. McLean, Canadian Commercial Agent in Japan, reports to the Trade and Commerce Department that the Japanese Customs authorities have issued notice to the effect that on and after October 1 the regulations respecting certificates of origin will be strictly applied with regard to imports under the conventional tariff. All goods not accompanied by certificate of origin upon invoice will be liable to the general or maximum tariff. There must be a certificate of origin by the Imperial Japanese Consulate or commercial agency at the place of production, manufacture or shipment of goods, or where there is no such consulate or agency, by the Custom House or other Government or public officer, or by the Chamber of Commerce of the locality. This certificate of origin shall contain the marks, numbers, descriptions, number of packages, weights or measurements of the goods and the place of production and fabrication.

A correspondent of Commercial Intelligence contributes an article to that paper on the secrets of German industrial and commercial success, which is deserving of attention. During the previous month he had been touring in Germany, and though he is not an admirer of German business methods, he acknowledges that he has been astonished at what he has seen in most of the manufacturing towns he has visited. He instances the German chemical industry, which is scarcely 30 years old, and tells us that there are now in Germany 9,000 factories employing 200,000 workmen, that the outturn of these factories will reach the prodigious sum of 1½ milliard marks (£75,000,000), and that five-sixths of the dyes used in the whole world are furnished by Germany.

Truth and fiction are dangerously mingled in the article on tariff matters which Mr. Edward Farrer, according to a cable despatch, has contributed to The *London Tribune*. The statement that the Canadian west is strongly against protection is entirely true. The statement that Canadians would destroy any Government that sought to treat Great Britain fairly in trade matters is an obvious absurdity. The British preference is heartily approved by the great mass of Canadians, and the opposition of the Canadian Manufacturers' Association to some of its features does not appear to have seriously shaken the position of the Laurier Government, which to-day has almost twice the majority it possessed when the preference was inaugurated.—The Globe.

Truly truth and fiction are dangerously mingled by The Globe, in even exceeding the statement of Mr. Farrer, which is saying a great deal. The statement that the Canadian West is strongly against protection is entirely untrue. The statement that Canadians would destroy any government that sought to treat Great Britain fairly in trade matters requires an explanation. What is meant by trade matters? The British preference is tolerated only by the great mass of Canadians. The desire of some of the advocates of it is to cover an effort to increase the duties on Yankee goods.

A novel method of advertising British industries has been hit upon by the Floating Exhibition Syndicate, of 96 Victoria Street, Westminster. The S.S. Cambroman will be fitted out as an exhibition, in which various British firms will be represented, and will visit the principal ports of the Empire, China, Japan, South America, and other regions important as markets for British products. The whole voyage will last about twelve months. At each port the exhibition will be "opened" by a prominent official, and arrangements will be made for the reception of visitors, alike as sightseers, customers and general traders. Montreal will be the first port of call of the vessel, and Quebec, Halifax, Havana, and the West Indies will then be visited.

So says our esteemed London contemporary, the Canadian Gazette, and the idea is immense and should be patented. It would be a grand sight to see the S.S. Cambroman, fully fitted out and equipped as an exhibition of British goods, lying at anchor or tied up at the wharves of some of the principal ports of Ontario, for instance. There are several good ports along the Hudson Bay coast of the province and we readily imagine the thousands and thousands of would-be buyers who would crowd the ship. It is to be regretted that the idea was not suggested in time to have this floating exhibition one of the most attractive features of the Toronto exhibition lately in full swing. The ship might also be taken to Brockville, Port Hope, Oakville, Bronte, Hamilton and Queenston. The show might be secured for next year.

CAPTAINS OF INDUSTRY.

The following items of information, which are classified under the title "Captains of Industry," relate to matters that are of special interest to every advertiser in these pages, and to every concern in Canada interested in any manufacturing industry whatever, this interest extending to supply houses also.

When the sawmill at Harrison River, on the line of the Canadian Pacific Railway was burned over a year ago, conditions were not such in the trade at that time as to warrant its re-equipment, and it accordingly was allowed to lie idle. Now, however, the Rat Portage Lumber Co. are looking into the question of installing new machinery and reopening the mill. Mr. D. Drysdale and associates, who own about 10,000 acres of timber on the Queen Charlotte Islands, have as the result of a trip north and inspection of the coastline in the vicinity of the limits, chosen a harbor there on which to erect an export mill of a capacity between a hundred and a hundred and fifty thousand feet per day. The harbor chosen lies between Skidegate and Rarriet Harbor, and is known as Clew Bay. It is said to afford an ideal site for a sawmill engaged in the manufacture of lumber for export. It is said that work on the erection of a mill at Clew Bay will be commenced very shortly, in fact as soon as arrangements for construction can be made by the London capital behind Mr. Drysdale. Over $250,000 will be spent in the erection of the mill and the installation of logging equipment.

The Chapman Double Ball Bearing Co. have awarded the contract for the brick and stone work on their new factory on Sorauren Avenue, Toronto, to Messrs. Waghorne and Walker, while the contract for the carpentering work has been awarded to James McKenzie.

A warehouse to cost $50,000 is to be built on Wellington Street West, Toronto, for the National Drug & Chemical Co., of Canada, Limited. The structure will be five stories, 200x60 feet.

One of the topics discussed at the Hamilton Board of Trade quarterly meeting on October 1, was a proposal to spend $100,000 on the fire department of Hamilton.

The Peterboro Steel Rolling Mills Co., who, it was announced, had decided to establish rolling mills in Peterboro, have informed the mayor of that city that they will not establish works there and have requested the withdrawal of a by-law authorizing a bonus to them.

D. McCall & Co., wholesale milliners, Toronto, have finished the excavating and will lay the foundation for a large warehouse on Wellington Street West, Toronto.

The Century Telephone Construction Co. have leased premises at 53 to 59 Adelaide Street West, Toronto. They have already secured a large order for the equipment of an independent telephone exchange at Ingersoll, Ont., and are in the market for telephone cross arms, insulators, top pins, side blocks and galvanized telephone hardware in carload lots, also for telephone cabinet work. After the first of the year they expect to instal such machinery as multiple spindle drills, milling machines, punch presses, screw machines, lathes, etc.

A. W. Bennett has opened an office at 40 Adelaide Street West. Among other lines he will handle will be the Albany rotary pump.

The Sylvester Mfg. Co., manufacturers of the Sylvester gasoline engine, Lindsay, Ont., boast a band of their own. The band was in Toronto with the Lindsay Oddfellows during the recent convention of the I.O.O.F. there.

The planing mills and wood factory of Messrs. Henderson Bros., Cobourg, Ont., were damaged by fire September 25.

The Melrose Abbey cheese factory, Havelock, Ont., was destroyed by fire September 4.

The Polson Iron Works, Toronto, will erect new buildings at a cost of about $100,000.

The Board of Education, Peterborough, Ont., will erect a new collegiate institute at a cost of about $61,000.

The annual meeting of the Savage Mountain Fire Brick Co., Frostburg, Maryland, showed their past year which wound up August 31, 1906, to be the most prosperous year in the history of that concern, they having made and shipped more brick at a fair profit than any other year in their history. The old officers, Charles C. Gorsuch, president; H. C. Gorsuch, vice-president; John A. Caldwell, treasurer and manager, were elected for the ensuing year.

The Beaver Lumber Co., Toronto, have been incorporated with a capital of $150,000, to manufacture lumber, timber, etc. The provisional directors include F. H. Potts, H. Hunter and A. Wellesley, Toronto.

The Roberts Engraving Co., London, Ont., have been incorporated with a capital of $40,000, to carry on a printing and engraving business. The provisional directors include N. A. Roberts, C. L. Edy, and W. B. Edminster, Toronto.

The Toronto Daily Standard Publishing Co., Toronto, have been incorporated with a capital of $500,000, to carry on a printing, publishing and engraving business. The provisional directors include H. S. Osler, J. F. H. McCarthy, and B. Spence, Toronto.

Messrs. Orr Bros., Toronto, have been incorporated with a capital of $120,000, to carry on a general contracting business. The provisional directors include R. J. Orr, W. Orr and G. Orr, Toronto.

The Exeter Times Printing Co., Exeter, Ont., have been incorporated with a capital of $10,000, to manufacture books, stationery and to carry on a printing and publishing business. The provisional directors include J. J. White, F. J. Wickwire and A. E. Hodgert, Exeter, Ont.

Glencoe Woolens, Limited, Glencoe, Ont., have been incorporated with a capital of $40,000, to manufacture woolens, etc. The provisional directors include J. S. Hogg, F. Hogg, Galt, Ont., and W. Hogg, Waterloo, Ont.

Mr. Bullis, Trenton, Ont., will erect a sawmill at Dryden, Ont.

Krug & Crosby, Hamilton, Ont., have added several machines to their machine shop and are expanding in several directions. One of these is the overhauling of second-hand machinery. They are advertising pumps and pulleys in the "For Sale" column of this issue.

A gas well has been struck on the Halliday farm, near Chatham, Ont., with a flow of about 1,500,000 feet per day.

A. A. Barthelmes, formerly of Messrs. A. A. Barthelmes & Co., Toronto, has purchased a block of land on Carlaw Avenue, and will erect a large piano factory there.

The Conger Lumber Co., Parry Sound, Ont., have purchased two timber berths adjacent to the Georgian Bay, containing about sixty million feet of lumber.

The Department of Public Works, Ottawa, invites tenders up to October 12 for the construction of a breakwater at Port Arthur, Ont.

The Lake of the Woods Milling Co., Kenora, Ont., have purchased from Wm. Hamilton & Co., Peterborough, Ont., a large wheel setting with a capacity of 6,000 h.p.

The Empire Salt Co., Sarnia, Ont., will erect a new salt well, 64x46 feet, which will have a capacity of 200 barrels per day.

The large lumber yards of Messrs. Ritchie Bros., Aylmer, Ont., were destroyed by fire September 20. Loss about $90,000.

The apple evaporator of R. J. Graham, Watford, Ont., was destroyed by fire September 18.

Messrs. Seaman Kent & Co., Port Arthur, Ont., will erect a wood-working factory there.

The premises of the Canadian Stove Grate Co., Toronto, were destroyed by fire September 19.

The business section of the town of Almonte, Ont., was destroyed by fire September 21. Loss about $125,000.

The Temiskaming & Northern Ontario Railroad shows an increase in revenue for the last six months of 234 per cent.

The ratepayers of Mount Forest, Ont., voted favorably on a by-law to grant $8,000 to the Weir Wardrobe Co., who will enlarge their factory there.

The factory and warehouse of the Canadian Oil Co., Toronto, were destroyed by lightning September 22. Loss about $100,000.

Over nine million dollars have been invested in buildings in Toronto since January, 1906.

The Knox Church building which is being erected in Toronto will cost about $100,000.

The congregation of St. Anne's Anglican church, Toronto, will erect a new edifice at a cost of about $35,000.

C. E. Ryerson, secretary-treasurer of the Toronto Public Library Board invites tenders up to October 10 for work and materials required in the erection of the Toronto Public Reference Library building.

The premises of the Mine Centre Lumber Co., Mine Centre, Ont., were destroyed by fire recently.

The ratepayers of Woodstock, Ont., voted favorably on a by-law to loan $25,000 to the Canadian Bearing Co.

The Bain Wagon Co., Woodstock, Ont., will erect an addition to their factory, 120x60 feet.

J. O. Walker, Goderich, Ont., has asked the town for a loan of $20,000 with which to erect a carriage factory.

The London Fence Co., London, Ont., will erect a factory at Portage la Prairie, Man.

The Verity Plow Co., Brantford, Ont., will erect an addition to their factory.

The Canadian Pacific Railway Co. have commenced erecting extensive additions to their docks at Port Arthur, Ont.

Messrs. Anderson & Anderson, electrical contractors, Port Arthur, Ont., will open a branch at Fort Frances, Ont.

The factory of the Leamington Basket Co., Leamington, Ont., was damaged by fire, September 27. Loss about $6,000.

The Department of Public Works, Ottawa, invites tenders up to October 20, for the construction of a breakwater at Goderich, Ont.

The McGregor Banwell Fence Co., Walkerville, Ont., manufacturers of ideal woven wire fencing, have incorporated a separate company in Manitoba to be known as The Ideal Fence Co., Limited, for the manufacture of fencing in the West. Two acres have been purchased on the main line of the Canadian Pacific Railway opposite the Canadian Pacfic Railway shops and a two-story brick factory is now being erected. Machinery will be installed, when completed, and this company will be in a position to fill orders for the coming season. The Walkerville plant is also being enlarged by an addition to the warehouse of 150x44 feet.

The Syracuse Smelting Works, Toronto, are continuing to get an increasing share in the babbit, sold all white metal business. They would like to secure agents in several of the larger industrial centres.

Wayland Williams & Dadson, who for almost two years have been Montreal agents for the Campbell gas engine and suction gas producer, have filed consent of assignment. The Canadian agency for the Campbell suction gas plant will be taken over by Mr. Geo. P. Wallington, operating under the style of The Producer Gas Co., 11 Front Street, East, Toronto.

The Galt Roller Co., Galt, Ont., will erect a large addition to their plant there.

The contract for a direct steamship service between Canada and Mexico on the Pacific coast has been signed by the Minister of Trade and Commerce, Ottawa. Under this contract, an English company, represented by Capt. Worsnop, will put two steamers of not less than 3,000 tons each on the route, thus giving a monthly service. Vancouver and Victoria will be the terminal ports in Canada, and Acapulco, Mazatian and Salina Cruz the ports of call in Mexico. Canada and Mexico each contribute an annual subsidy of about $65,000.

The premises of the Gilmour Hotel, Ottawa, were destroyed by fire recently. Loss about $125,000.

The premises of the Severn Hotel, Severn Ont., were destroyed by fire September 26. Loss about $2,500.

The Standard Bank of Canada has opened a branch at Belleville, Ont.

The Sage Storm Front Co., Rosini, Ohio, have started a factory in St. Thomas, Ont., for the manufacture of buggy coverings.

The Department of Public Works, Toronto, invites tenders up to October 13 for the construction of Normal school buildings in Peterborough, Stratford, and North Bay, Ont.

The engine room of the Kensington Furniture Co., Goderich, Ont., was destroyed by fire September 27.

The Blanchite Process Paint Co., Toronto, have been organized with a capital of $250,000. They will take the building formerly occupied by the Henderson Roller Bearing Co., King Street West.

The Rochester Mining Co., Toronto, have been incorporated with a capital of $40,000, to carry on a mining, milling and reduction business. The provisional directors include J. E. Dupuis, Massey, Ont.; J. Le Frois, Rochester, N.Y., and Z. Gallagher, Toronto.

The Transcontinental Railway Commission, Ottawa, will shortly call for tenders for the construction of two hundred miles of the line north of Lake Abittibi.

Bernard Schuchardt has registered to do business in Montreal under the name of Schuchardt & Schutt. This firm have offices in the leading European centres, also in New York, carrying machinists' and other factory supplies.

The Canadian Northern Railway Co. will erect workshops at Quebec City.

Penmans, Limited, Montreal, have been incoporated with a capital of $4,000,000, to manufacture cotton, woolens, yarns, etc. The charter members include T. C. Casgrain, E. M. McDougall and E. F. Surveyer, Montreal.

The Milton Hersey Co., Montreal, have been incorporated with a capital of $40,000, to carry on the business of chemical, mining and civil engineering. The charter members include M. H. Hersey, H. Lester and P. C. Ryan, Montreal.

The Stuart Turbine Co., Montreal, have been incoporated with a capital of $20,000, to manufacture engines, boilers, machinery, etc. The charter members include H. A. Allan, G. Hannah and A. J. Collins, Montreal.

Megadyne, Limited, Montreal, have been incorporated with a capital of $250,000 to manufacture explosives, powder, chemicals, etc. The charter members include C. A. Barnard, R. Roy and C. A. Sara, Montreal.

The Canadian Express Co., Montreal, will erect a ten-story office building at a cost of about $250,000.

The Canadian Pacific Railway Co., Montreal, will erect a paint shop adjoining the Angus shops at a cost of about $70,000.

The sash and door factory of Damien Lalonde, Montreal, were damaged by fire September 20. Loss about $4,000.

The bakery of D. Beauvais, St. Cesaire, Que., was destroyed by fire September 20. Loss about $7,000.

The Quebec government will erect a new jail in Montreal at a cost of about $1,000,000.

The Canadian Northern Railway Co. will erect shops at Montreal at a cost of about $1,000.000.

Messrs. Baxter, Patterson & Co., Montreal, manufacturers' agents, have been organized to handle all kinds of iron and wood-working machinery, engines, fire appliances and engineering and mill supplies. The company have been appointed sole Canadian agents for several large firms in England, Scotland, and on the continent, among them being: Geo. Angus & Co., manufacturers of leather and Balata belting, Newcastle-on-Tyne, England; Walter McFarlane & Co., manufacturers of ornamental castings and soil pipe, Glasgow; Wm. Bain & Co., manufacturers of fencing; and the Cundall Gas Engine Co., England. Special arrangements have also been made with the Nicholson File Co., Port Hope, Ont., whereby the firm will manufacture their highest grade file.

The Sorel Mfg. Co., Sorel, Que., have been incorporated with a capital of $20,000, to manufacture clothing, etc. The charter members include J. F. R. Latraverse, A. Prudhomme, and S. M. Pearson, Sorel, Que.

The foundry of J. B. Tardiff, Plessissville, Que., was destroyed by fire September 23. Loss about $15,000.

La Fonderie de Cloches Crouzet Hildebrand, Limited, Montreal, have been incorporated with a capital of $100,000, to manufacture furnaces, machinery, etc. The charter members include J. D. Rolland, A. Turcotte and P. V. Rougier, Montreal.

Messrs. Brandram-Henderson, Montreal, have been incorporated with a capital of $1,700,000, to manufacture white lead, paints, oils, varnishes, etc. The charter members include J. R. Henderson, C. H. Potts and G. Henderson, Halifax, N.S.

The Dominion Lumber Co., Quebec, Que., have been incorporated with a capital of $825,000, to manufacture lumber, timber, machinery, vessels, etc. The charter members include E. G. Meredith, G. Parent and E. W. Ievers, Quebec, Que.

The wood-working factory of Messrs. Silliker & Co., Amherst, N.S., was destroyed by fire September 25. Loss about $75,000.

The Dominion Iron & Steel Co., Sydney, N.S., earned $70,000 during the month of August.

Ganong Bros., manufacturers of chocolate and confectionery, St. Stephen, N.B., are building a new boiler and engine house and new chimney. A new extra boiler is to be installed and later a new engine. As the firm now has to work nights to fill orders they have decided to erect new works, to about double their capacity. They will also put in a sprinkler system.

The Sunday school building of the Centenary Methodist church, St. John, N.B., was destroyed by fire September 26. Loss about $20,000.

The St. John Lumber Co., St. John, N.B., will erect new saw mills there.

Messrs. McLean, Holt & Co., St. John, N.B., will erect a manufacturing plant on Courtenay Bay, N.B.

The premises of the Strathcona Hotel, Emerson, Man., were destroyed by fire September 26. Loss about $30,000.

The Cockshutt Plow Co., Winnipeg, Man., will erect a large addition to their warehouse there.

Messrs. Thos. Ryan & Co., boot and shoe manufacturers, Winnipeg, Man., will erect a branch building at Calgary, Alta.

The Labatt Mfg. Co., London, Ont., have opened a branch at Winnipeg, Man.

The Northern Bank have opened a branch at Crandall, Man.

The capital of the Winnipeg Stone Co., Winnipeg, Man., has been increased to $60,000.

The congregation of the Roman Catholic Church, Grandview, Man., will erect a church building.

The warehouse of the Boyce Carriage Co., Winnipeg, Man., was destroyed by fire September 27. Loss about $28,000.

The Gurney Foundry Co., Toronto, will erect a five-story warehouse at Winnipeg, Man., at a cost of about $50,000.

Public Works Department, Ottawa, have awarded the contract to Messrs. Quinlan & Robertson, Montreal, for the construction of the lock and dam at St. Andrew's Rapids, Red River, Man., at a cost of about $500,000.

The city council, Prince Albert, Sask., have passed a by-law granting $25,000 to the Canadian Northern Railway Co., who will erect a station there.

The Bank of Toronto have opened a branch at Langenburg, Sask.

The Merchants Bank will erect a brick building at Camrose, Alta., at a cost of about $10,000.

The ratepayers of Qu'Appelle, Sask., will vote on a by-law to give a franchise to the Moore Milling Co. for the installation of an electric light plant there.

A waterworks system will be installed at Battlefield, Sask., and a building will be erected large enough to accommodate an electric light plant.

The Merchants Bank of Canada is opening a branch at Sedgewick, Assa.

The Northern Bank is opening a branch at Sedley, Assa.

The ratepayers of Moosomin, Sask., voted favorably on a by-law to raise $32,000 for a waterworks system.

A hospital will be erected at Vegreville, Alta., at a cost of about $6,000.

The Canadian Pacific Railway Co. will erect a new station at Pense, Sask.

Messrs. Gordon, McKay & Co., Toronto, will erect a large warehouse at Calgary, Alta.

J. Mitchell, Weyburn, Sask., will erect a postoffice at a cost of about $5,000.

The ratepayers of Moose Jaw, Sask., have voted favorably on a by-law to raise $90,000 for the purpose of bringing water from Snowdis Springs, a distance of seven miles.

The Bank of Montreal, Vancouver, B.C., will erect a large addition to their building there.

The Hall Elevator & Grain Co., Vancouver, B.C., will erect a large flour mill with a capacity of 500 barrels per day.

G. H. Halse, Vancouver, B.C., will erect a large hotel there.

Messrs. Pither & Leiser, Victoria, B.C., will erect a five-story block.

The Bank of Commerce will erect a building at Nelson, B.C.

The Columbia Milling Co., Enderby, B.C., will erect a flour mill at Lethbridge, Alta., which will have a capacity of 200 barrels per day.

PERSONALS.

Mr. V. T. Bartram, Montreal, has been appointed purchasing agent of the Temiskaming & Northern Ontario Railway Co. Mr. Bartram has been chief clerk of the purchasing department of the Canadian Pacific Railway Co., Montreal.

Mr. Edward H. Lynde, who for many years was connected with the Lackawanna Steel Co., in charge of their Bessemer steel rail department at Scranton, Pa., has been engaged by Robt. W. Hunt & Co., to succeed to the work of the late partner, Mr. Albert W. Fiero.

Mr. P. F. Kobbe, director and assistant secretary of the Westinghouse Electric & Mfg. Co., died at his home at Stockbridge, Mass., on September 21.

The wedding of Charles H. Bechtel, the junior member of Bechtels, Waterloo, Ont., and Miss Mabel Cherry, of Galt, Ont., occurred at Trinity church, Galt, September 12. The best man was Peter B. Gibson, secretary of the Scott Mfg. Co., St. Louis, Mo. On their return from an extended wedding trip, the happy couple will go to housekeeping in a new home of red pressed brick at Waterloo.

Mr. Ed. Irving, of the Sunbeam Incandescent Lamp Co., Toronto, has just returned from a trip west as far as Calgary. Mr. Irving reports an exceptional demand for Sunbeam lamps. In fact the company have been compelled to double the capacity of their plant.

Considerable importance will be attached to the announcement made by The Packard Electric Co., to the effect that Russell A. Stinson and Frederick J. Bell have become associated with the company and that its Eastern office at Montreal became under their charge from September 15, the territory covered being from Kingston east. The services of Mr. J. Warren, who has been acting manager, will still be retained, and the office staff otherwise added to to take care of the increasing business. The offices of the company have been removed from the Street Railway Chambers to more commodious quarters in the Bell Telephone Building, Rooms 127 and 129, Montreal.

LARGE GENERATORS.

The Montreal Light, Heat & Power Co. have recently contracted with the Canadian Westinghouse Co., for a large addition to their power equipment. The apparatus contracted for is for their new Soulanges Canal power station on the St. Lawrence River. The equipment consists of three Westinghouse 3,750 k.w. revolving field alternating current, two-bearing generators connected to water turbines. These generators are 7,200 alternations, 4,000 volts, three-phase, operating at 225 revolutions per minute. There are also two Westinghouse 150 k.w. direct current 125 volt exciter units. Westinghouse 2,500 k.w. oil-insulated, water-cooled transformers to the number of thirteen are an important part of the equipment. Seven of these transformers will be used for raising the voltage at their generating station from 4,000 to 44,000 volts, and six of them will be used at the lowering end of the transmission line, stepping down the voltage from 44,000 to 12,000. The generators and exciters will be controlled by motor-operated rheostats and the complete switchboard apparatus which the Canadian Westinghouse Co. are furnishing for both the main and substations, will involve the latest type of electrical control, representing the highest development of switchboard apparatus.

EXTENDING THEIR POWER PLANT.

The Ontario Power Co., which operates on the Canadian side of Niagara Falls, recently decided upon an enlargement of its power house capacity and contracted with the Westinghouse Electric & Mfg. Co. for two of the largest power generators ever turned out at East Pittsburg. These machines are of 10,000 h.p. each and are called water-wheel generators. The Power Co. has already installed four machines of a similar type, which were also furnished by the Westinghouse people. This last contract includes switchboard appliances. The additional power apparatus was made necessary by the great demand for electrical energy to operate manufacturing plants in the company's territory.

LOW SUMMER TOURIST RATES WEST.

During the entire summer the Chicago & North-Western Railway will have in effect very low round trip tourist rates to Colorado, Utah, California, Oregon, Washington, and British Columbia points. Choice of routes going and returning with favorable stopovers and time limits. Very low excursion rates to the Pacific Coast from June 25 to July 7. For further particulars, illustrated folders, etc., write or call on B. H. Bennett, General Agent, 2 East King Street, Toronto, Ont.

W. J. McGUIRE & SONS, LIMITED.

The firm of W. J. McGuire & Co., Toronto and Montreal, have been incorporated under the style of W. J. McGuire & Sons, Limited, to carry on business as contractors for and workers in plumbing, heating, lighting, drainage, ventilating, sprinkling equipments and fire extinguishing apparatus and appliances, and as manufacturers, buyers, sellers and dealers in the apparatus, appliances, machinery and articles required by or which may be conveniently used in or in connection with any of the said businesses, with incidental and subsidiary powers. The capital stock of the company is placed at $250,000. The provisional directors are W. J. McGuire, George F. McGuire and Owen Neily, and the head office, Toronto.

THE JOHN MORROW SCREW CO., LTD.

J. A. Coulter and O. E. Robinson, Ingersoll, Ont., D. H. Shapley and F. H. Deacon, Toronto, and W. H. Wortman, London, Ont., have taken out charter of incorporation for the John Morrow Screw Co., Limited, Ingersoll, Ont., to "manufacture, buy, sell or otherwise deal or traffic in iron, steel, lead, tin, zinc, copper, metals, and other materials, and any or all articles consisting or partly consisting of iron, steel, lead, tin, zinc, copper, wood or other materials, and all or any products thereof, with incidental and subsidiary powers." The capital stock of the company is $100,000.

MACHINERY AND ENGINEERING.

A Review of New Machinery, Power Appliances and Factory Equipment of all Kinds.

Practical Experiences on Electrical Driving.

JOHN A. FERNLEY, NEW BEDFORD, MASS.*

I do not think that anyone to-day seriously doubts that electrical driving has many advantages over either the rope or belt drive, and certainly the writer's experience has proved that they are neither few nor small, still, on the other hand, there are many people who think that its advantages are offset by its cost of installation, etc., coupled with a vague suspicion that it is not thoroughly understood, and is apt to cause a greater amount of trouble than either the belt or rope drive; and so conclude to stick to the old methods; while others who are satisfied as to its advantages as given by its advocates and friends, want to know what the results are in actual working, and whether it can be handled with success in an ordinary cotton mill, stating that while they are convinced of its advantages in general, they want to be enlightened as to its every day working.

To be able to clearly understand and give full consideration to the arguments for or against an electric drive, we must keep in mind the fact that electricity is not a primary energy, but merely a secondary power that depends upon a mechanical plant to generate it. Coal must be used to develop the mechanical energy before the electricity is generated and therefore, there is no advantage in this respect, the cost being about the same for the production of horse power in either system, the difference being, that in one case the power has to be carried to its destination by a series of belts, thus providing one large unit from which all the subdivisions derive their power; while in the other it is developed into electricity and by wires carried to the switch board for distribution around the mill and then subdivided into many units of different capacity, each one of which is entirely independent from the others and can be controlled either in the mill or engine room, without interfering with the operation of any of the other units.

These units are known as induction motors, and are simply a machine used to change the electrical into the mechanical energy, and depend upon the amount of electricity as expressed in volts and amperes, for their efficiency.

Thus we find that a double process is required in electrical driving before the energy is at the point where it can be used and between the changing of the steam power into electricity, and its conversion back into mechanical energy by the motor, there is quite a loss of power.

When a motor is built it is wired and wound to perform a certain amount of work and is in two parts, termed the "armature" and "field." The field is charged with electricity from the generator and as a result the armature is made to revolve and thus operate the shafting. The higher the load, the more resistance there is to the action of the electricity and this produces a loss of speed which in some cases reaches as high as three per cent. between the full load and no load speeds. It will be readily seen that if the full current was thrown into the field at the starting of the motor, it would have to start at its highest velocity, owing to the fact that the load would be at its lowest point and this, of course, is something no machine could stand. To get over this difficulty, in each motor is placed what are known as "resistance" grids, the functions of which are to take some of the electricity away from the motors and thus enable them to be started at a sufficiently low speed, and after a few seconds these grids are gradually cut out or short-circuited and the motor brought up to its full speed.

It is right at this point where one is apt to find out that there is more to the successful running of an electric plant than appears on the surface of things and where experience comes in to teach many lessons. In the first place it is necessary that someone shall be responsible for the starting up of the motors and this means one or more persons in each room. I notice Mr. Merrill in his paper read before this Association at the spring meeting of 1905, stated that "In some cases, all the motors on one floor are arranged to be controlled from the same station, thus allowing one operator to start quickly the entire department." It is clearly impossible for one person to do this and yet preserve the individuality of the different units and to destroy this individuality would take away one of the principal advantages that electricity has over any other kind of drive.

The employment of so many different people in the starting of the motors involves danger from the fact that upon the way in which the work is done, depends the whole power of that particular unit, for should the electricity be switched on with the resistance out, the motor is apt to be put out of commission, while on the other hand if the resistance is left in too long they are liable to become overheated and weakened with the result of the loss of that unit of power until repairs can be made.

I know of several different cases where trouble has occurred, in one instance, the grids were burnt out before the mill had been running very long and before the officials were aware of the desirability of having spare sets on hand, with the result that the machinery was stopped until a set could be made for this particular motor, which, with the time taken up by transportation, etc., took up quite a long time. The only safe course is to have a complete set on hand for the different horse power motors and where a mill is equipped with machines ranging from 10 to 200 h.p., it means a large outlay for supplies that many never be used, but which should be obtained when the motors are installed, so as to forestall any difficulty that may arise should they give out.

The next of importance in the motor is the "air-gap" or the space that is left between the revolving armature and the stationary field. This space is made as narrow as possible owing to the fact that the permeability of air is very low, and therefore, the smaller the space that the current has to cross, the greater the efficiency of the motor.

It will readily be seen that in a room where there is a large amount of dust and cotton fibres in the air, such as is found in card rooms, etc., this air gap will soon become more or less filled with the same, and thus in a measure insulate the field from the armature and give the current an added resistance to overcome before doing the work of operating the machinery.

To overcome this it is necessary to have the motors thoroughly cleaned out, by blowing out this accumulation of dust and dirt. The time between such "blowing off" depends entirely upon where the position of the motor is, but I incline to the idea of giving it a good cleaning at certain stated intervals rather than to simply clean it a little every day.

About the only effectual way to get this lint and dust from the interior of the motor is to install a compressed air system; the pump for which may be placed in the engine room basement or other convenient place, and to carry this air by means of pipes to every motor in the mill, placing a valve on each side of the motor. Select some man to attend to this work in the different rooms and provide him with about six feet of very strong rubber hose, capable of withstanding a pressure of about 55 pounds. Have it understood that the air must be applied to each side of the motor more than once, blowing from one side and then the other alternately. The reason for this is because there are so many crevices and angles in a motor that blowing from one side alone would only distribute the cotton dust around the inside of the motor.

Then the electrician should go over the motors and inspect them, testing them with the gap guage to see that there is no danger of the armature touching the field.

This test should be carried out often, for upon it depends the very life of the motor. As stated earlier in this paper, for plain reasons the motors are made with the air gap as small as possible; and should the armature through any cause move out of its proper position, it would come in contact with the field and thus burn out the motor. This, of course, is something that may never occur, but any person knows that bearings are apt to become overheated and melt or even to gradually wear away, unless properly attended to. This danger the gap guage is a preventive for; but in the case of overheating, the trouble sometimes develops very rapidly, and before preventive measures can be taken, the damage is done.

I had a personal experience along this line which illustrates this point and at the same time shows the seriousness of the trouble.

In some unaccountable way, the dripcock on one of the motors that runs the looms was opened and thus allowed all the oil to leave the bearings. The result was a hot bearing, a short-circuited motor, and a stop-

* From a paper read before the National Association of Cotton Manufacturers of the United States.

page of that particular motor for a period of six weeks, owing to the fact that the motor had to be taken down and shipped to be rewound. This is not an isolated case, for at the time of writing I know of one mill that has had an armature away from the mill for about three months. Take these cases in connection with the fact that the motor is an independent unit and that the power cannot be utilized in any other way, and it is easy to see how annoying and serious these breakdowns are.

There is another item which may be worth a brief reference in this paper and that because of the annoyance which is caused thereby. If you will recall I stated that there is a loss of speed between the no load and full load of a motor. This is claimed by the electric people to amount to about two per cent. but I have found it to exceed that amount in some cases. In the mule room this difference shows itself more than in any other department of a mill, owing to the fact that the load is so variable. These changes are caused by the difference in the amount of power required to operate a mule in its various operations and where the mules are on different numbers of yarn, cannot be avoided. The result of these variations of speed on the quality of the work soon shows itself, both in kinks and other troubles and the only help I have been able to find is in substituting a larger belt, so as to overcome the loss as much as possible.

Coming back to the generator, we are confronted with a machine which has certain advantages over the belt drive but which has also some disadvantages. There is no question but that where a mill plant is overloaded to any great extent, that electricity is preferable to belts, from the fact that a belt will only carry a certain load, no matter what the capacity of the engine, while in the case of a generator you can carry up to 40 per cent. of an overload and this at a very small loss in comparison to belts. This is an advantage which most especially applies to mills which are run by two engines and generators, both being run together as one unit, from the fact that if one engine or generator is disabled, it is possible to throw a large proportion of the whole load upon the remaining generator, thus cutting down the loss to some extent, while with a belt drive the loss of the engine would be total. Still, even at this point there are possibilities of accidents that may occur which are not found in a mechanical drive.

Before it is possible to obtain any power from the generator, it is necessary to charge the field with a current of electricity, thus producing a residual magnetism from which the machine is built up. Should the "steam exciter" in any way become useless, it would mean a total suspension, because no power could be generated; so that we have an added point of danger which is not present in an ordinary drive.

Another experience which I have had recently was the burning out of a number of pole pieces or coils, in one of the generator armatures. The engines seemingly were running with their usual smoothness and were carrying a load under their rated capacity. The generator was apparently all right, when about eight o'clock in the morning, a noise resembling somewhat the roar of a cannon came from the engine room. As soon as possible the engines were shut down, but it was impossible to find out at first what the trouble was, owing to the room being filled with smoke, but eventually it was found that a large hole had been burnt through the coils, and that the solid iron casing had been burned away. Apparently, there was no cause for the accident, except that it might have resulted from an imperfectly insulated coil.

Owing to the fact that such an accident had not been expected, no spare coils were at the mill, and on telephoning after some, it was found that there were none at the works at Schenectady, thus giving us the rather unpleasant prospect of a shutdown until these coils could be made and shipped to the mill. We finally decided to endeavor to make some temporary coils in our machine shop, and see what we could do to get the machine running. It was rather a doubtful chance, but fortunately it was successful, and we were able to start up after a shutdown of two days and a half.

Apart from such troubles as these, there is no doubt but that electrical driving is advantageous, and in a large plant, more economical, than the mechanical. It is very flexible and requires a minimum amount of shafting.

In reference to the amount of power used, there seems to be but little difference in the loss on an electrical and mechanical drive, as far as getting it to the room is concerned, but there is a decided advantage in favor of electricity after it reaches the motor. In any room but the mule room, the drive is more even and gives better results.

THE GROWTH OF LABOR SAVING MECHANISMS.

The strenuous effort to increase output which characterizes every American industry under the present condition of extraordinary demand has, says the Iron Age, caused much greater attention to be given to the details of economical handling of materials and products. While many manufacturing establishments, especially those that have been built in recent years, are well equipped with such types of cranes, hoists, elevators, conveyors and industrial railroads as are adapted to their individual needs there are numerous others that still depend to a great extent upon manual labor to perform the same functions. The cost of man's labor is greater, and there is the still other very important objection that men cannot work so quickly, with so little delay of machinery, as does the mechanical system, whatever it may be, that is specially intended for the work.

Where labor is heavy, or where the volume is great, the crane, carrier or hoist saves valuable time. In supplying work to a machine, for example, every minute saved in preparing the work, so that the tool may be operated as continuously as possible, is a distinct gain in the volume of production, and the ever prevailing cry to-day is for increased production. With customers sending urgent and even angry letters and telegrams demanding deliveries, with order books becoming more and more unwieldly in the ratio of their totals to the limit of production, it is little wonder that we hear manufacturers strongly regretting that they had not prepared themselves to get the greatest possible production out of their works before the demand required it. The labor saving device has been a friend in need to many such men. A hoist here, a new crane or two, a carrier system or some other means of lightening the shop burden, and at the same time reducing costs and increasing profits correspondingly, has proved the advantage of machinery over human labor in very many instances during the past year. The result is a continued demand upon manufacturers of all sorts of labor saving devices of this description.

A general scanning of the industrial and commercial field clearly shows that the mechanical appliance for conveying materials and goods, both in process of manufacture and ready for the market, is almost in the infancy of its usefulness. The manufacturing world is full of opportunities for adapting mechanical systems for the more economical conduct of business. In commercial or transportation lines the field is probably even broader. The announcement of the equipment of a Mississippi steamboat with elevators and a conveyor system for the handling of freight and coal is significant, for it opens a field of usefulness for conveyor systems of several descriptions. The owners of this new boat were led into substituting mechanical for manual labor by the unreliability of the men upon whom they have to depend to do the work of loading and unloading vessels. The frequent strikes of longshoremen in this and other countries should result in similar measures on the docks and piers and on the ships which ply many other waters than those of the Mississippi and its tributary streams. To-day most of the coal and grain and other bulky freights of like general description is handled exclusively by power-driven mechanisms. Occasionally, however, one still sees a large coal depot which points the difference between old and modern methods, where hand cars convey the coal from the handling platform to the sheds, materially increasing the time required in handling, and with such waste of time the cost is correspondingly greater. Many of the smaller steamers which carry freight between the large cities and places comparatively near at hand could be economically loaded by means of a conveyor system, replacing large gangs of men who must be regularly employed. The electric motor plays an important part in the expense of such a system, keeping it down to comparatively small cost, for power can be purchased by meter rates and used only when the mechanism is operating. These systems are not expensive when the cost is compared with the reduction in the pay roll. The saving in wages of a few men will pay the interest on the cost of quite an extensive system of conveyors, while the simplest form is all that would be necessary in most instances.

These statements are but generalizations when compared to the great field of usefulness which the power conveyors of many descriptions offer. In nearly every line of industry the opportunity exists for saving money by substituting power for man's labor. The impelling force of a period of extraordinary business activity should bear results not only in the present but in the future, as men learn from experience and prepare for good times when business conditions are not of the best. The labor saving device is just as important in times of industrial dullness as in times such as these. In both cases the better the facilities for manufacturing the less the cost of the product. In busy times the manufacturer values volume fully as much as he values cost, sometimes more so. In dull

times he wants the lowest possible cost that he may have the better chance for taking such business as may come up. The labor saving device produces both greater volume and lower costs.

ELECTROLYTIC CORROSION OF STRUCTURAL STEEL.

By M. Toch, in Electrical Magazine.

Engineers have commented publicly on the electrolytic corrosion of structural steel, particularly those parts which are either in the ground or surrounded by concrete and partly above ground, with a view to determine beyond question at which of the poles corrosion occurs, and whether one pole is more active than the other. A series of experiments were made by the author, and definite results have been obtained.

The first experiment was performed by taking two sheets of high-grade watch-spring steel, which is extremely susceptible to corrosion, and connecting them with the ordinary bluestone telegraph cell. A Pignolet combined volt and ammeter was placed in the circuit, and the two pieces of steel buried up to 5 inches in the sand. The voltage was 0.05, the current varied from 0.02 to 0.05 amp., and the distance between the plates in the damp sand was 1½ inches. Careful observation was made every day to see that the current was uniform, and the sand was first moistened with salt water and then continually moistened with distilled water, so that the same strength of salt solution was maintained. This experiment was conducted for 100 days, and assuming that the current travels from plus to minus, or from anode to cathode, the anode being connected with the copper and the cathode being connected with the zinc, corrosion was noticed almost immediately at the anode, and the plates showed violent corrosion at the anode and practically no corrosion at the cathode. The plates indicated some slight corrosion on the cathode, which, however, was principally chemical corrosion.

The next experiment was tried exactly in the same manner—for a shorter period of time, but instead of using two plates three plates were used, the third one being designated as the "free" plate, in which chemical corrosion had full sway. It was not connected by any wire to the electric circuit. At the end of six days these plates were removed; the anode showed marked corrosion, the cathode practically none at all, and the "free" plate showed a fair average between the anode and the cathode; and it can be deduced that the difference between the anode and cathode corrosion is equal to the "free" corrosion. In other words there is many times more corrosion on the anode than there is on the "free" plate, and no corrosion on the cathode plate.

The plates were very carefully varnished all over to preserve them after the experiments were completed. The rust produced was first the green ferrous oxide, $Fe(OH)_2$, which, being a very unstable product, was quickly converted in the air into $Fe_2O_3(H_2O)$.

The voltage was 0.1, and the current 0.1 of an ampere. The salt solution was four times as strong as that used in the first experiment.

The third experiment was, however of the greatest importance, owing to the fact that the author attempted to imitate the conditions exactly as they exist in buildings. The same kind of steel was taken and embedded in various mixtures of concrete, starting from neat cement and going up to 1, 3, 5.

There is a well known law in physical chemistry that reactions which take place with an increase of pressure are retarded by an increase of pressure, and the question has come up as to whether it is possible for steel to corrode when surrounded by concrete, many engineers holding that the alkaline nature of the cement will prevent the corrosion, and others holding that in conjunction with this condition the pressure exerted by the concrete prevents chemical decomposition. In order to throw some light on this subject, the following experiment was made.

In the first place, cement of known composition was taken. The cement for these experiments was what might be termed a tricalcic silicate and calcium aluminate. This is in contradistinction to the general classes of Portland cements containing dicalcium ferrite as a part of their composition and free from calcium sulphate in excess. A cement of the calcium aluminate class, free from iron and free from calcium sulphate, is a well known protector of steel and iron against corrosion, and this class of cement was used in these experiments. The pieces of steel were connected up with six elementary cells of sufficiently high voltage and amperage, and it was impossible to get a direct reading on the volt-ammeter, the instrument being too sensitive. The seven parts of cement containing the steel trips were then put into the circuit and wetted every few hours with solutions of 5 per cent. sodium chloride and 1 per cent. nitric acid and water, in order to increase their conductivity and produce corrosion as rapidly as possible.

The average voltage was 0.05 and the current 0.05 amp. throughout the entire experiment. Corrosion was immediately noticed on the anode pole, and the pat made of neat cement, which should have protected the steel most perfectly against all kinds of corrosion, showed a hair line split colored with rust at the end of the third day, which demonstrated that the chemical reaction of rusting had taken place at the anode; that the molecular increase had likewise taken place, and the pressure caused by the molecular increase had split the block.

The steel in each alternate pat was painted half the length, which was embedded in the cement with an insulating paint of known composition. The results obtained after these various briquettes were broken open, demonstrated that electrolytic corrosion takes place most violently at the anode unless the steel be coated with an insulating medium. Cement concrete or even neat cement, is, therefore, no protection against electrolytic corrosion unless the steel be insulated as heretofore mentioned. There was absolutely no corrosion where coated with insulating material. It must be noted that the cathode in all these experiments was perfectly free from any signs of oxidation.

The result of this entire series of experiments is to prove conclusively that electrolytic corrosion of structural steel embedded in concrete or sand takes place only at the anode, and there with great violence; and, furthermore, that the cathode is protected by the electrical current. The popular impression that cement is a protector against corrosion of all kinds is fallacious, and that the anode does not only rust very violently, but a molecular increase of volume may take place which will split the concrete shell.

Another conclusion arrived at is that the electrolytic rusting of grillage beams of buildings need not be feared if the structural steel be protected by a good insulating material, but the insulating medium should form a bond with concrete.

WE ALL WANT SUCH MEN.

A New York employer closed a recent letter to Hapgoods, the national organization of brain brokers, with the following description of the men he desired for several responsible positions:

"Men who are not for sale; men who are honest and sound from centre to circumference, true to the heart's core; men who will condemn wrong in friend or foe, in themselves as well as others; men whose consciences are as steady as the needle to the pole; men who will stand for the right if the heavens totter and the earth reels; men who can tell the truth and look the world and the devil right in the eye; men who neither brag nor run; men who neither flag nor flinch; men who have courage without whistling for it and joy without shouting to bring it; men to whom the current of everlasting life runs still and deep and strong; men who know their place and fill it; men who mind their own business; men who will not lie; men who are willing to earn what they eat and perform what they are paid for doing."

WHERE AN "AD." WOULD HAVE HELPED.

"That's the best little machine for my use that I ever got hold of," remarked a farmer to his dealer recently. "Why haven't you kept them before?"

"Because I did not know there was such a thing on the market," was the reply. "You see they are made by a little one-horse establishment about a hundred miles from here that nobody ever heard of. The fellow has been circularizing me for the last five years, I guess, and I have chucked his stuff into the stove unread. The last batch I examined by the merest accident, got interested, and finally sent in a small order. I sold three machines at once and they have all proved highly satisfactory."

"It's a lesson to me to find out what every man wants to talk to me about before turning him down, whether he comes in an automobile or a buff envelope with a one-cent stamp on it. If he can afford to come at all I cannot afford to turn him under without giving him a hearing."

The Canadian Pacific Railway have placed an order with the Locomotive & Machine Co., Montreal, for 50 locomotives of the heavy consolidated type for freights. These engines will mean a total outlay of almost one million dollars. While the order is being filled the Canadian Pacific Railway Angus shops will continue to turn out one engine a week. This means that within the next year the locomotive equipment of the company will be increased by 100 of the most modern and efficient engines.

BUILDING AND CONSTRUCTION.

Sand-Lime Brick Tested.

By H. P. Naylor.*

The rapid and widespread growth of the sand-lime brick industry in the United States and Canada during the last few years has served to bring this new product before the building public with a suddenness that has caused astonishment and at the same time distrust. Surprise arose from the fact that such quantities of fine looking building material could be produced from a sand bank, and doubt regarding its quality resulted from the fact that its method of manufacture was so radically new.

That bricks of burnt clay have been used as building material from the beginning of history is well known, but the artificial stone, made from a composition of sand and lime into brick form, is so nearly like antiquity, has been but recently discovered.

In the Temple of Salamo,—one of the ancient Temples of Jerusalem—there are to-day masses of artificial stone, composed of sand and lime, which the passage of thousands of years has only made harder and firmer.

That small use of artificial stone has been made, in comparison with clay, is the result of natural conditions.

Clay is naturally plastic and easily moulded, readily retaining the shape given it. Sand, not being of this nature, and the method of its proper combination with lime to form a strong homogeneous compound not being easily solved, the problem was left to a more scientific age for answer.

Looking into the origin of business we find the brick of to-day are the result of modern ideas in manufacture applied to more ancient methods. A good lime mortar, if given time and opportunity for all the lime to become thoroughly carbonated, is a very strong material; many proofs of this, with references, might be given here but without going back to the time of the ancients, we find in the present era that oftentimes when old brick buildings are being torn down, the mortar is frequently the hardest part of the building and will break the brick before it will let go.

From the standpoint of the geologist, sand is one of the materials which is decomposed with the greatest difficulty and it is formed by the decomposition of rock through the agency of weathering, the materials which are most easily decomposed are carried away and the more resisting materials, such as silicia, remain behind. The silica has been ground down by abrasion into the form which we recognize as sand, and this is the material which forms the major portion of sand-lime brick, viz., one of the most permanent materials known in the world.

The balance of the brick is composed of calcium hydrate (more commonly known as slacked lime) the proper treatment of these two ingredients, combined with strong pressure put on each brick by a press designed for the business (The Berg) and the hardening of the material under heavy steam pressure, produces in ten hours time a brick that is ready for the market, one which "rings like a bell," when tapped with a hammer, each of an even size, with a face as perfect as a straight edge, square corners and of a uniform color.

Exposed to the atmosphere the hardening process continues, we might say indefinitely, as is known by science and proved by like methods and mixtures of the ancients.

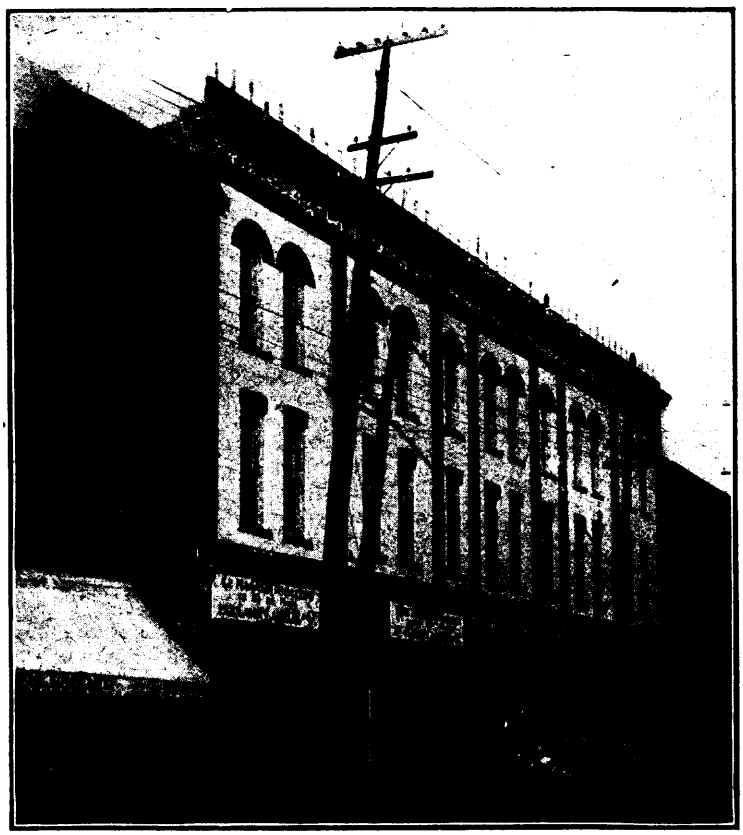
Various methods of manufacture are now in use in the United States and Canada, although Canada is monopolized by the "Berg System" and as a result the quality of the product is much varied, as the quality of the output depends upon the equipment installed.

While a batch of sand and lime can be stirred up by hand, pressed and hardened and brick will result, this is not the kind of brick to earn a reputation for a factory of the kind we are making with the "Berg" machinery and appliances.

Without going into details regarding the manufacture and the various methods, we simply say, the product of any factory, where good sand and lime are obtainable is dependant for quality upon the installation of the proper machinery.

Our aim at all times is to produce only the very highest grade of sand-lime brick, and when we construct the plant, we install the necessary machinery to attain this end. Such construction is necessarily an expensive one in comparison, but we consider the end justified the cost and the product of our factory stands with a peer in the sand-lime brick industry of the world.

We operate at all seasons of the year and are not confined to working during the summer months only, as our sand during every month of the year goes through a dryer as it comes from the hill and all moisture is taken out. A fixed percentage of dry sand and lime is then accurately and mechanically measured by a special machine designed for the purpose and there is absolutely no guess work or difference in the mixture, the percentage of sand and lime being the same at all times.



A Store Front of Sand-Lime Brick.

The damp material goes through two other mixing machines, which distributes the moisture evenly throughout the mass; it then drops by gravity to the press, where the brick are made by a very powerful machine, known as the "Berg Brick Press," which puts on a pressure from three ways, viz.: an up-and-down movement of the sand and lime in the moulds. First, it presses from the top, then from the bottom, then it presses the center and relieves, then comes the third pressure from both top and bottom together.

From the press the bricks are piled on cars in systematic order and conveyed to the hardening cylinder.

At the close of the day the cylinder being

*Mr. Naylor is General Manager of the Port Arthur Sand-Lime Pressed Brick Co., Ltd., Port Arthur, Ont., whose complete plant was manufactured and installed by A. Berg & Sons, Manning Chambers, Toronto.

full with loaded cars of brick, the head of the cylinder is then closed and hermetically sealed and a steam pressure of 120 pounds to the square inch is turned on to the cylinder for ten hours time.

Owing to the complete mixing given to the material, every particle of the sand is surrounded by a thin coating of lime and this lime in the brick attacks the silica and chemically creates a perfect and very substantial bond of all the material, which, as we have before stated, continues to harden with age, but the brick are hard enough and strong enough the next morning for commercial work to be loaded on the cars.

From the description given it is very evident that a perfect mixture is all important so there may be no weak spots in the brick, owing to a poor distribution of the lime, and the grinding of a certain percentage of the sand is also quite necessary, so that all interstices are filled with lime and fine sand and with such a structure sudden expansion and contraction are not noticeable as in stone and some other forms of building materials.

From an architectural point of view, sand-lime brick of good quality possess great possibilities and their popularity among builders is growing very fast.

Contractors who have employed them appreciate their uniformity of size, and the less mortar and time required for laying a wall and the artistic appearance of the finished work.

The following are characteristics of sand-lime brick: They improve with age, great crushing strength, low in porosity, no scaling, slight heat conductivity, unaffected by acids. Absolutely sanitary, no disintegration with extreme climatic changes, practically no expansion from heat, great electrical resistance, economy in laying on account of: uniformity of size, shape and color; minimum of bats; facility with which brick can be cut. The natural color resembles that of Indiana sandstone; different shades, however, are made, and the colors will not fade.

The following tests were made on sand-lime brick in the School of Practical Science, Toronto, Ont., May 23, 1906, and presented to Robert Kennedy, manager, Canada Sand-Lime Pressed Brick Co., Toronto Junction, Ont.:

"The brick submitted was one made of sand and lime, on which I beg to submit the following report after test:

Size of brick, 8 7-16x4x2⅝ inches.
Area of surface exposed, 33¾ square inches.

	Max. Load.	Load per sq. in.
Sample No. 1 said to be 2 months old	120.000	3.555
" " 2 per Mr. Riddell	82.000	2.428
" " 3 after soaking	78.000	2.311
" " 4 (Culled brick) per Mr. Riddell	40.000	1.185
" " 5 said to be week old	106.000	3.140
" " 6 same as No. 1	119.000	3.526
" " 7 settled on edge	35.000	1.715

Yours truly, (Sgd.) A. T. Laing."

TEST ON FUSIBILITY OF SAND-LIME BRICK.

"The brick submitted was one made of lime and sand. A piece of brick about 1x1x1 inch was placed in the melting hole of the electric furnace and the temperature gradually raised.

"1st. At about 2,980° F., the brick began to fuse slightly on the edges; at 3,362° F., it was completely fused.

"2nd. A fresh piece was put in and the temperature of fusion noted twice—3,100° F.

"3rd. At 3,800° F., the brick volatilized. 4th. Cooled the furnace and put in a fresh piece of brick; then raised the temperature again. The brick began to fuse at 3,200° F.

"Conclusion.—The brick are able to withstand a temperature up to 2,980° F., but above this temperature the brick puffed up slightly and fused at 3,100° F.

"Temperature at which various materials of construction melt, as given by 'Chemiker Kalendar,' are:—

"Cast iron, 1,900° F.
"Wrought iron, 2,700° to 2,900° F.
"Steel, 2,350° to 2,500° F.

"Saul Dushman,

"Demonstrator in Electrochemistry, School of Science, Toronto, Ont."

TEST MADE BY THE HARRIS ABATTOIR CO., LIMITED.

"Toronto, June 4, 1906.

"Mr. Robert Kennedy, manager Canada Sand-Lime Pressed Brick Co.

"Dear sir,—I have completed a test of a sample of three bricks which you left with me some time ago, along the lines suggested by you. The brick were soaked in water for about two days, and were then placed in our freezing room, which is carried at a temperature of about ten degrees above zero. They were left in this room for about a week, and were then carried out and left on top of our boilers. They were then soaked again in water for about four hours, and placed in the freezer the second time, the temperature being about the same as before. They remained in the freezer for two days with no apparent effect on the appearance of the brick. Yours very truly,

"J. S. McLean,

"Secretary The Harris Abattoir Co., Limited."

CORROSIVE TEST MADE IN THE UNITED STATES.

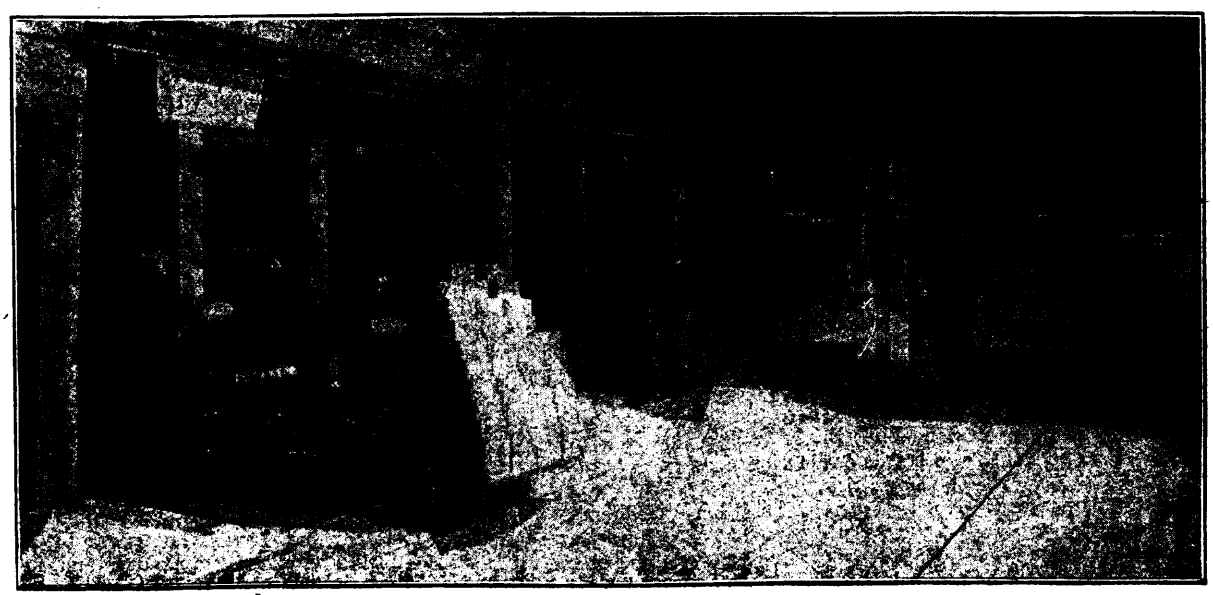
Sand-lime brick was exposed to the corrosive action of the moist atmosphere containing sulphuric, nitric, and carbonic acids for a period of 16 days and washed with clean water daily without any effect on sand-lime brick.

The same test was made for a period of four months without any effect on sand-lime brick.

FIRE TEST.

United States government arsenal, at Watertown, Mass., heated three sand-lime bricks for a period of one hour over an open wood fire. Numerous cracks were found. Bricks were then crushed and showed an average ultimate strength of 4,020 pounds per square inch.

R. W. Hunt & Co. submitted a sand-



A BERG SAND-LIME BRICK PLANT.

lime brick to a temperature of 2,800° F., for one-half hour and it showed no bad effect or indication of fusion.

periods. No effect from this test on sand-lime brick.

The same test as above was made with

CRUSHING STRENGTH PER SQUARE INCH.

		After freezing.
Sand-lime brick (common)	2,718 pounds.	3,023 pounds.
" " " (face)	6,025 "	6,765 "
Clay brick (salmon)	2,325 "	2,216 "
" " (hard B)	4,288 "	4,577 "
" " (re pre)	4,469 "	4,566 "
Indiana sandstone	4,152 "	5,561 "

FREEZING TEST.

	Loss by weight.	
Sand-lime brick (common)	0.41 per cent.	No crack or deterioration.
" " " (face)	0.20 "	" " " "
Clay " (salmon)	0.74 "	" " " "
" " (hard B)	0.16 "	" " " "
" " (re P.)	0.22 "	" " " "
Indiana sandstone	0.37 "	" " " "

ABSORPTION TEST.

Sand-lime brick (common)	17.07 per cent. by weight.
" " " (face)	9.00 " " "
Clay brick (salmon)	16.65 " " "
" " (hard B)	9.15 " " "
" " (re P.)	10.71 " " "
Indiana sandstone	5.65 " " "

Note.—The above tests were made by drying for 48 hours at a temperature of 212 degrees F., and then immersing in distilled water for 48 hours.

Indiana sandstone has been taken for comparison in making tests as it is recognized as one of the best and most popular building stones.

ACID TESTS.

Action of acidified atmosphere:—

Samples exposed to moist atmosphere of sulphuric, nitric, and carbonic acids for a period of 12 days, each sample washed daily so as to resemble the condition of the atmosphere in chemical works where brick would be subject to alternate dry and wet

sulphurated hydrogen and produced no effect on sand-lime brick.

Samples were separately immersed in a solution of 1 per cent. and 2 per cent. of sulphuric, hydrochloric, and nitric acids for 8 days and produced no alteration on sand-lime brick.

The same experiment was made by using 5 per cent., 10 per cent., and 50 per cent. of sulphuric and nitric acids with no effect on sand-lime brick, in the 5 per cent. and 10 per cent. solution and only slight attack in the 50 per cent.

Conclusion.—From these experiments that sand-lime brick has great power of resisting the action of strong acids and that no atmospheric conditions are likely to corrode or disintegrate sand-lime brick.

CRUSHING TESTS.

Sand-Lime Brick.	Indiana Sandstone.	Clay Brick.
2,100 to 7,000 pounds.	4,152 pounds.	(Sal.).... 300 to 2,300 pounds.
		(hard B)..... 1,800 "
		(re. P)..... 4,300 "

CRUSHING TESTS AFTER FREEZING.

Sand-Lime Bricks.	Indiana Sandstone.	Clay Brick.
15 to 20 per cent. higher than above tests.	5,561 pounds.	Sal. 5 per cent. lower.
		H.B. 5 " " higher.
		R.P. 5 " " "

ABSORPTION TEST.

Sand-Lime Brick.	Indiana Sandstone.	Clay Brick.
3 to 15 per cent.	5.65 per cent.	Sal. 17 to 30 per cent.
		H.B. 9 to 20 " "
		R.P. 10 to 15 " "

FREEZING TEST.

Less than one-half per cent. loss by weight after freezing in distilled water for 48 hours, freezing at 5 degrees F., for 16 hours, immersing in distilled water for 8 hours at 70 degrees F., and this repeated 10 times.

Indiana Sandstone, 37 per cent. loss by weight after freezing.

Clay Brick (Salmon).....24 per cent. loss by weight.
" " (Hard burned)....18 " " " "
" " (Re Pressed).... 22 " " " "

The following tests were made by Henry S. Speckman Engineering Co., Philadelphia:

FREEZING TEST.

Sand-Lime Brick.

Loss by weight, 6.20 per cent. No cracks or deterioration.

Clay Brick.

Loss by weight, 0.74 per cent.	No cracks or deterioration.	(Salmon).
" " " 0.18 "	" " "	(Hard Burned).
" " " 0.22 "	" " "	(Re Pressed).

Indiana Sandstone.

Loss by weight, 0.37. No cracks or deterioration.

The United States government and the Dominion government are using large quantities of sand-lime brick, they are going into public libraries, handsome residences, churches and business operations; also, along the banks of canals for underground sewers, factory chimneys, etc.

We have the brick. Are you interested, if so, drop a line to the writer at Port Arthur, Ont.

A NOVEL FOUNDATION.

Engine vibrations have been prevented from causing annoyance in the basement of a London house by the use of a novel platform. The unit is a 20 h.p. gas engine with extra heavy flywheel, which drives a 12½ k.w. dynamo. According to The Engineer, of London, a 5-inch bed of concrete was first laid down, on which ten 3 by 4½-inch timbers were placed at equal distances apart. A series of 2-inch holes were bored in the top of each timber, and a powerful spring, carrying 500 pounds with one-half-inch compression, was placed in each hole. There are 48 springs in all, and they support a galvanized iron tray 10 feet long, 5 feet wide and 5 feet deep. This holds the concrete base, 2 feet 8 inches thick, on which the engine rests. The exhaust and compressed air connections are of flexible metallic tubing and the other connections of rubber tube. When the unit was started, it was found to sway longitudinally somewhat, so at each end a timber was placed.

UNITED STATES STEEL IN CEMENT.

Chicago, September 27.—Official announcement was made to-day of plans by which the United States Steel Corporation not only will control the Portland cement industry in Chicago, but will invade the East by building a plant near Pittsburg.

On October 1 the Universal Portland Cement Co., capitalized nominally at $1,000,000, will take over the plants and business of the cement department of the Illinois Steel Co. It is planned to increase the output of cement by nearly 150 per cent. by the erection of a new plant near Pittsburg. To do this $3,000,000 will be expended, taken from an appropriation made by the management of the Steel Corporation last spring. When the plants are completed the yearly output will be about six million barrels and will exceed by 10 per cent. that of the entire country.—U.S. Metal Market.

SOLD PRODUCER GAS PLANT.

The Economic Light, Heat & Power Supply Co., Toronto, have sold the Pintsch suction gas producer and the National gas engine which they had in operation at the Toronto exhibition to the Palmer House, for electric lighting. Later a larger plant will be installed by this hotel to operate elevators, laundry, etc., as well as the lighting.

As a business proposition, optimism is the surest, safest and best paying investment a man can have. The pessimist and hard luck are close companions, and pessimism comes first to form the companionship.—Modern Machinery.

TALK TO "THE MAN WHO BUYS" WITH A SMALL "AD." ON THIS PAGE

FACTORY LOCATIONS.

The following Canadian municipalities are offering inducements to secure manufacturing establishments. Inquiries should be addressed to the Mayor, Town Clerk or Board of Trade of the respective cities:

Barrie, Ont.
Brantford, Ont.
Hamilton, Ont.
Peterborough, Ont.
Regina, N.W.T.
Sherbrooke, Que.
Toronto, Ont.

BOILER FOR SALE.

Fifty Horse Power Boiler—used one year; fittings complete; will sell cheap.

H. DICKENSON,
607 Sherbourne St., Toronto.

FOR SALE

Two Blake single acting steam pumps, thoroughly overhauled. Sizes: 6in. x 6in. x 3¼in., capacity 45 gals. and 5in. x 6in. x 3in., capacity 40 gals. One Duplex pump 6in. x 8in. x 4½in., capacity 120 gals. All water end parts are brass and are tested ready for work.

Second-hand wood spilt pulleys, from 8in. x 8in. to 50in. x 9in., in varying widths. Write for prices.

KRUG & CROSBY, Hamilton, Ont

WANTED—FARM NEAR TORONTO

WANTED—Information regarding good farm for sale, with good title, somewhere near Toronto. Give price, also description and character of soil. State when possession can be had. Owners only need answer. State how far from city and mention improvements. Address,

W. C. CUNNINGHAM,
Andrus Bldg., Minneapolis, Minn.

TANGYE GAS ENGINE and DOMINION GAS PRODUCER.

The most effective combination to produce the cheapest power. Over a dozen plants running in Canada—some of them for three years.

Write for fuller details.

W. GILLESPIE,
98 East Front Street, Toronto

THE BEST GASOLINE ENGINE

On the continent for all purposes is the Sylvester. Parties wanting cheap power will consult their own interest in purchasing a Sylvester, built in sizes 1½ to 32 horse power; portable, stationary and marine; best and cheapest power available; if you want an easy starting, simple and reliable engine that will give full rated power in coldest weather, buy the Sylvester; works as easy in January as July on gasoline, coal oil or distillates; write for catalogue. **The Sylvester Mfg. Co. Limited, Lindsay, Ont.**

FOR $9.00

You can have an advertisement in this space—half inch for a year, 24 insertions, for nine dollars. **—The Canadian Manufacturer, McKinnon Bldg., Toronto.**

ANY COLOR OF CRAYON

that you want can be obtained from us. We are specialists for Cotton, Woolen and Worsted Manufacturers. No trouble to send samples.

LOWELL CRAYON CO., - Lowell, Mass.
Original Manufacturers.

JOHN J. GARTSHORE

88 Front St. W., Toronto.

Rails and SUPPLIES,
New and Secondhand,
For RAILWAYS, TRAMWAYS, ETC.
Old material bought and sold.

GASOLINE ENGINES

FOR LAUNCHES AND CANOES.

2-H.P. ENGINE COMPLETE FOR $65.

M. O. CROSS ENGINE CO.
DETROIT.

WM. BARBER & BROS.

Georgetown, Ont.

Manufacturers of.....

Book and Fine Papers.

THE.....

Toronto Paper Manufacturing Co.,
Cornwall, Ont.

Manufacturers of Engine Sized Superfine Papers, White and Tinted Book Papers, Blue and Cream Laid and Wove Foolscaps, Account, Envelope and Lithographic Papers, etc.

CASTINGS GREY IRON
IN ROUGH OR MACHINED.
PATTERNS WOOD OR IRON.
ESTIMATES FURNISHED.
DAVID MAXWELL & SONS
ST. MARY'S, ONT.

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Second-Hand Remington Typewriter in good repair. Cheaper than renting. Let us send you samples of its work.

Canadian Manufacturer
McKINNON BLDG. *TORONTO*

MAIN 4834 Expert in Time Saving Devices

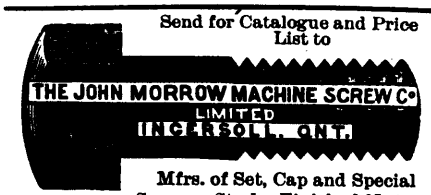
HENRI VIAU

Business Methodizer
(Accountant)
Room 14
"La Presse" Building
Office Systems Installed MONTREAL

FYFE'S STANDARD

HAY, COAL AND WAGON **SCALES**
Warranted Superior Quality.
498 St. Paul St., MONTREAL.

THE WELDING PROCESS FOR THE FOUNDRYMEN
Gives liquid steel at 5400° F, anywhere in half a minute.
Write for booklet.
Goldschmidt Thermit Co.
334 St. James St., Montreal



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HAMILTON, ONT.

FILE and RASP MANUFACTURERS
AND RE-CUTTERS.

A trial order solicited. Write for terms.
C. P. MOORE, PROPRIETOR.

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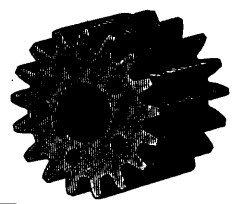
MANUFACTURED BY
THE HORSBURGH & SCOTT CO.
Cleveland, Ohio.



J. B. HALL

112 Adelaide St. West, Toronto

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DIES, TOOLS AND SPECIAL MACHINERY MADE TO ORDER.

First-class work only. Designs made for machine you may require.

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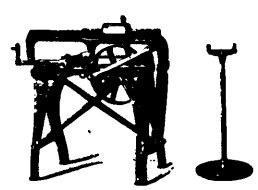

None Faster. None Stronger
None Cheaper.
WRITE FOR PRICES
KRUG & CROSBY
HAMILTON
Also manufacturers of upright, bench and friction drills, drill chucks, etc.

CLASSIFIED INDEX.

Abrasives
Williams, A. R. Machinery Co., Toronto.

Acids
Canada Chemical Co., London, Ont.
Canada Process Co., Toronto.
Nichols Chemical Co. of Canada, Montreal.

Air Compressors
Allis-Chalmers-Bullock, Limited, Montreal.
Canada Foundry Co., Toronto.
Canadian Rand Drill Co., Sherbrooke, Que.
Darling Bros., Montreal.
Smart-Turner Machine Co., Hamilton, Ont.

Alum
Nichols Chemical Co. of Canada, Montreal.

Aluminum
Northern Aluminum Co., Pittsburg, Pa.
Syracuse Smelting Works, Montreal.

Angles, Beams and Girders
Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Hopkins, F. H. & Co. Montreal.
Nova Scotia Steel & Coal Co., New Glasgow N.S.

Aniline Colors and Dyewood Extracts
Benson, W. T. & Co., Montreal.
Brunner, Mond & Co., Norwich, England.
Canada Chemical Mfg. Co., London, Ont.
Canada Process Co., Toronto.
Cassella Color Co., New York City.
McArthur, Corneille & Co., Montreal.
Nichols Chemical Co. of Canada, Montreal.
Winn & Holland, Montreal.

Annealing Muffles and Furnaces (Wire)
Leslie, A. C. & Co., Montreal.
Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Antimony
Syracuse Smelting Works, Montreal.

Anvils and Vises
Hopkins, F. H. & Co., Montreal.
Leslie A. C. & Co., Montreal.

Architects
Gearing, H., Toronto.
Parke, R. J. Toronto.
Vogel, C. H., Ottawa.

Automatic Gear Cutting Machines
Becker-Brainard Milling Machine Co., Hyde Park, Mass.

Axles
Hopkins, F. H & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Babbitt Metal
Petrie, H. W., Toronto.
Syracuse Smelting Works, Montreal.

Banks
Bank of Hamilton Hamilton, Ont.

Bar Iron and Steel
Bourne-Fuller Co., Cleveland, Ohio.
Hopkins, F. H. & Co., Montreal.
Leslie, A. C. & Co., Montreal.
London Rolling Mills, London, Ont.
Union Drawn Steel Co., Hamilton, Ont.

Belt Dressing
McLaren, J. C. Belting Co., Montreal and Toronto.
Petrie, H. W., Toronto.
Sadler & Haworth, Montreal and Toronto.
Williams, A. R. Machinery Co., Toronto.

Belt Fasteners
Bristol Co., Waterbury, Conn.
McLaren, D. K., Montreal and Toronto.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Belting (Cotton)
Dominion Belting Co., Hamilton, Ont.
McLaren, D. K., Montreal and Toronto.
McLaren, J. C. Belting Co., Montreal and Toronto
Petrie, H. W., Toronto.
Sadler & Haworth, Montreal and Toronto.

Belting (Leather)
McLaren, D. K., Montreal and Toronto.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

CLASSIFIED INDEX.

(CONTINUED).

Belting (Rubber)

Gutta Percha & Rubber Mfg. Co., Toronto.
McLaren D. K., Montreal and Toronto.
Petrie, H. W., Toronto.

Belting and Supplies

Bristol Co., Waterbury, Conn.
Dominion Belting Co., Hamilton, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Jeffrey Mfg. Co.. Columbus, Ohio.
McLaren, D. K., Montreal and Toronto.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Blast Furnace Brick

Dunbar Fire Brick Co., Pittsburgh, Pa.
Elk Fire Brick Co., St. Mary's, Pa.
Hamilton Facing Mill Co., Hamilton, Ont.
Harbison-Walker Refractories Co., Pittsburg, Pa.
Pennsylvania Fire Brick Co., Beech Creek, Pa.
Queen's Run Fire Brick Co., Lock Haven, Pa.
Stowe-Fuller Co., Cleveland Ohio.

Blowers

Hamilton Facing Mill Co., Hamilton, Ont.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Boiler Compounds

Canada Chemical Mfg. Co. London, Ont.
Canada Process Co., Toronto.
Hamilton Facing Mill Co., Hamilton, Ont.

Boiler Inspection

Boiler Inspection & Insurance Co., Toronto.
Canadian Casualty & Boiler Insurance Co., Toronto.

BOILERS (See Engines and Boilers)

Bolts and Nuts

London Rolling Mills, London, Ont.
Morrow John Machine Screw Co. Ingersoll, Ont.

Brass Founders

Hamilton Brass Mfg. Co., Hamilton, Ont.

Building and Paving Brick

Dunbar Fire Brick Co., Pittsburgh, Pa.
Hamilton Facing Mill Co., Hamilton, Ont.
Harbison-Walker Refractories Co., Pittsburg, Pa.
Pennsylvania Fire Brick Co., Beech Creek, Pa.
Queen's Run Fire Brick Co., Lock Haven, Pa.
Stowe-Fuller Co., Cleveland, Ohio.

Building Iron and Steel

Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Expanded Metal & Fireproofing Co., Toronto.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Builders' Materials

Albert Mfg. Co., Hillsboro, Ont.
Canada Foundry Co., Toronto.
Conduits Company, Limited, Toronto.
Expanded Metal & Fireproofing Co., Toronto.
Gartshore, John J., Toronto.
Hopkins, F. H. & Co., Montreal.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.
Sheldon & Sheldon, Galt, Ont.

Cables

Dominion Wire Rope Co., Montreal.
Greening, B. Wire Co., Hamilton, Ont.
Phillips Eugene F. Electrical Works, Montreal.

Canada Plates

Leslie, A. C. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Canoes

Peterborough Canoe Co., Peterborough, Ont.

Caps

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Card Clothing

McLaren D. K., Montreal and Toronto.

Cast Iron Pipe

Canada Foundry Co., Toronto.
Montreal Pipe Foundry Co., Montreal.
McDougall, John, Caledonian Iron Works Co. Montreal.

Castings (Grey Iron, Malleable Iron and Brass

Jenckes Machine Co., Sherbrooke, Que.
Kerr Engine Co., Walkerville, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
McKinnon Dash & Metal Works Co., St. Catharines, Ont.
Maxwell, David & Sons, St. Mary's, Ont.
Smart-Turner Machine Co., Hamilton, Ont.

Cement Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Bradley Pulverizer Co., Boston, Mass.
McDougall, John, Caledonian Iron Works Co., Montreal.

Centrifugal Pumping Machinery

Morris Machine Works, Baldwinsville, N.Y.
Smart-Turner Machine Co., Hamilton, Ont.

Chain Making Machinery

(Welded Coil Chain)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Channels

Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Leslie, A. C. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow N.S.

Charcoal Pig Iron

Canada Iron Furnace Co., Montreal.
McDougall, John, Caledonian Iron Works Co. Montreal.

Chemicals

Canada Chemical Co., London, Ont.
Canada Process Co., Toronto.
Nichols Chemical Co. of Canada, Montreal

Chemists

Heys, Thomas & Son, Toronto.

Clay Working Machinery

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Coal, Coke and Charcoal.

Bourne-Fuller Co., Cleveland, Ohio.
Hamilton Facing Mill Co., Hamilton, Ont.
Milnes, James H. & Co., Toronto.

Coal Cutting Machines

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian Rand Drill Co., Sherbrooke, Que.
Jeffrey Mfg. Co., Columbus, Ohio.

Coal Tipples

Jeffrey Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.

Coil Chains

Greening, B. Wire Co., Hamilton, Ont.
Leslie, A. C. & Co., Montreal.

Coke Oven Brick

Dunbar Fire Brick Co., Pittsburgh Pa.
Stowe-Fuller Co. Cleveland Ohio.

Collection Agency

Petrie, H. D., Hamilton, Ont.

Concrete Mixers

Hopkins, F. H. &. Co., Montreal.

Condensers

Smart-Turner Machine Co., Hamilton, Ont.

Conduits (Interior)

Conduits Company, Limited, Toronto.

Contractors' Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Gartshore, John J., Toronto.
Hopkins, F. H. & Co., Montreal.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.
Smart-Turner Machine Co., Hamilton, Ont.

Contractors' Plants

Allis-Chalmers-Bullock, Limited, Montreal.
Hopkins, F. H. & Co., Montreal.
Jenckes Machine Co., Sherbrooke, Que.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.
Williams A. R. Machinery Co., Toronto.

Conveying Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Jeffrey Mfg. Co., Columbus Ohio.
McDougall John, Caledonian Iron Works Co. Montreal.
Perrin, William R. & Co., Limited, Toronto.
Smart-Turner Machine Co., Hamilton, Ont.

Copper Materials

Greening, B. Wire Co. Hamilton, Ont.
Phillips, Eugene F. Electrical Works, Montreal.
Syracuse Smelting Works Montreal.

Corrugated Iron

Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Covers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Cranes (Electric and Hand Power)

Smart-Turner Machine Co., Hamilton, Ont.

Crayons

Lowell Crayon Co., Lowell, Mass.

Crucibles

Dixon, Joseph, Crucible Co., Jersey City, N.J.
Hamilton Facing Mill Co., Hamilton, Ont.
McCullough-Dalzell Crucible Co., Pittsburg, Pa.
Syracuse Smelting Works, Montreal.

Crucible Caps

Hamilton Facing Mill Co., Hamilton, Ont.
McCullough-Dalzell Crucible Co. Pittsburg, Pa.

Cruicible Covers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Cutter Grinding Machines

Becker-Brainard Milling Machine Co., Hyde Park, Mass.

Dashes

McKinnon Dash & Metal Works Co. St. Catharines, Ont.

Dies (Socket, Sewer Pipe and Tile)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Directories

Kelly's Directories, Limited, Toronto

Draw Benches (Wire)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Dredges

Allis-Chalmers-Bullock, Limited, Montreal.

Drills

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Petrie, H. W., Toronto.

Drills (Pneumatic and Rock)

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian Rand Drill Co., Sherbrooke, Que.
Jeffrey Mfg. Co., Columbus, Ohio.

Drop Forgings

Globe Machine & Stamping Co., Cleveland, Ohio

Drop Forging Dies

Globe Machine & Stamping Co., Cleveland Ohio.

Dry Kiln Apparatus

Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Dust and Shavings Separators

Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co. Boston, Mass.

Dye Stuffs and Chemicals

Benson, W. T. & Co., Montreal.
Brunner, Mond & Co., Northwich, England.
Canada Chemical Mfg. Co., London, Ont.
Canada Process Co., Toronto.
Cassella Color Co., New York City.
McArthur, Corneille & Co., Montreal.
Nichols Chemical Co. of Canada, Montreal.
Winn & Holland, Montreal.

DYNAMOS (See Motors and Dynamos)

Electric Meters and Transformers

Allis-Chalmers-Bullock, Limited, Montreal.
Packard Electric Co., St. Catharines, Ont.

Electric Mine Locomotives

Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Jeffrey Mfg. Co., Columbus, Ohio.

Electrical Repairs

Keystone Engineering Co., Toronto.

Electrical Supplies

Allis-Chalmers-Bullock, Limited, Montreal.
Bristol Co., Waterbury, Conn.
Canadian General Electric Co., Toronto.

CLASSIFIED INDEX.

(CONTINUED).

Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Electrical Construction Co., London, Ont.
Forman, John, Montreal.
Jones & Moore Electric Co., Toronto.
Keystone Engineering Co., Toronto.
Packard Electric Co., St. Catharines, Ont.
Toronto & Hamilton Electric Co., Hamilton, Ont.

Elevators and Conveyors

Allis-Chalmers-Bullock, Limited, Montreal.
Darling Bros., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.

Elevator Insurance

Canadian Casualty & Boiler Insurance Co., Toronto

Emery and Emery Wheels

Forman, John, Montreal.
Hamilton Facing Mill Co., Hamilton, Ont.
Petrie, H. W., Toronto.

Engineers (Chemical)

Heys, Thomas & Son, Toronto.
Hunt, Robert W. & Co., Chicago, Ill.

Engineers (Civil)

Parke, R. J., Toronto.
Vogel, C. H., Ottawa.

Engineers (Consulting)

Aitken, K. L., Toronto.
Electrical Construction Co., London Ont.
Fensom, C. J., Toronto.
Gearing, H., Toronto.
Hunt, Robert W. & Co., Chicago, Ill.
Keystone Engineering Co., Toronto, Ont
Marion & Marion, Montreal.
Parke, R. J., Toronto.
Perrin William R. & Co., Limited, Toronto.
Vogel, C. H., Ottawa.

Engineers (Contracting)

Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Darling Bros., Montreal.
Electrical Construction Co., London Ont.
Fensom, C. J., Toronto.
Keystone Engineering Co., Toronto.
McDougall, John, Caledonian Iron Works Co., Montreal.
Robb Engineering Co., Amherst, N.S.

Engineers (Electrical)

Aitken, K. L., Toronto.
Allis-Chalmers-Bullock, Limited, Montreal.
Canadian General Electric Co., Ltd., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Canadian White Co., Montreal.
Crocker-Wheeler Co., St. Catharines, Ont.
Electrical Construction Co., London, Ont.
Fensom, C. J., Toronto.
Jones & Moore Electric Co., Toronto.
Keystone Engineering Co., Toronto.
Marion & Marion, Montreal.
Toronto & Hamilton Electric Co., Hamilton, Ont.

Engineers (Mechanical)

Allis-Chalmers-Bullock, Limited, Montreal.
Babcock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
Electrical Construction Co., London, Ont.
Fensom, C. J., Toronto.
Gearing, H., Toronto.
McDougall, John, Caledonian Iron Works Co., Montreal.
Hunt, Robert W. & Co., Chicago, Ill
Kerr Engine Co., Walkerville, Ont.
Marion & Marion, Montreal.
Robb Engineering Co., Amherst, N.S.
Sheldon & Sheldon, Galt, Ont.
Smart-Turner Machine Co., Hamilton, Ont.

Engineers (Mill and Hydraulic)

Fensom, C. J., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.
Vogel, C. H., Ottawa.

Engineers (Mining)

Heys, Thomas & Son, Toronto.
Mills, S D. Toronto.

Engineers and Contractors

Jeffrey Mfg. Co., Columbus Ohio.
Jenckes Machine Co., Sherbrooke, Que.
Smart-Turner Machine Co., Hamilton, Ont.

Engines and Boilers

Allis-Chalmers-Bullock, Limited, Montreal.
Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Goldie & McCulloch Co., Galt, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Hopkins, F. H. & Co., Montreal.
Jenckes Machine Co., Sherbrooke, Que.
Morris Machine Works, Baldwinsville, N.Y
McDougall, John, Caledonian Iron Works Co., Montreal.
Petrie, H. W., Toronto.
Robb Engineering Co., Amherst, N.S.
Sheldon & Sheldon, Galt, Ont.
Smart-Turner Machine Co., Hamilton, Ont.
Sturtevant, B. F. Co., Boston, Mass.
Williams, A. R. Machinery Co., Toronto.

Engravers

Canadian Manufacturer, Toronto
Jones, J. L. Engraving Co., Toronto.

Exhaust Fans

Hamilton Facing Mill Co., Hamilton, Ont.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Exhaust Heads

Darling Bros., Montreal.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Hyde Park, Mass.

Exhausters

Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Hyde Park, Mass.

Factory Sites

(See Factory Locations, page 31.)

Feed Water Heaters

Babcock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.
Pittsburg Filter Mfg. Co., Pittsburg, Pa.
Robb Engineering Co., Amherst, N.S.
Smart-Turner Machine Co., Hamilton, Ont

Feed Water Purifiers

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Files

Spence, R. & Co., Hamilton, Ont.

Fillet (Pattern)

Hamilton Facing Mill Co., Hamilton, Ont.
Sadler & Haworth, Montreal and Toronto.

Filters (Oil)

Babcock & Wilcox, Limited, Montreal
Darling Bros., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.
Perrin, William R. & Co., Limited, Toronto.

Filters and Filtering Systems (Water)

Babcock & Wilcox, Limited, Montreal.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.
Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Financial

Bradstreet's, New York City.
Dun, R. G. & Co., Toronto.
Neff & Postlethwaite, Toronto.
Petrie, H. D., Hamilton, Ont.

Finials

Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Fire Brick and Clay

Dunbar Fire Brick Co., Pittsburgh, Pa.
Elk Fire Brick Co., St. Mary's, Pa.
Hamilton Facing Mill Co., Hamilton, Ont.
Harbison-Walker Refractories Co., Pittsburg, Pa.
Pennsylvania Fire Brick Co., Beech Creek, Pa.
Queen's Run Fire Brick Co., Lock Haven, Pa.
Stowe-Fuller Co., Cleveland, Ohio.

Fire Escapes

Darling Bros., Montreal.

Fireproof Partitions

Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Flour Mill Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Goldie & McCulloch Co. Galt, Ont.

Forges and Blowers

Canada Foundry Co., Toronto.
Hamilton Facing Mill Co., Hamilton, Ont.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Founders

Canada Foundry Co., Toronto.
Goldie & McCulloch Co., Galt, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.
Robb Engineering Co., Amherst, N.S.
Smart-Turner Machine Co., Hamilton, Ont.

Foundry Facings and Supplies

Hamilton Facing Mill Co., Hamilton, Ont.

Fuel Economizers

Babcock & Wilcox, Limited, Montreal.
Sturtevant, B. F. Co., Hyde Park, Mass.

Furniture (Lodge, Opera and School)

Canadian Office & School Furniture Co., Preston, Ont.

Galvanizing

Ontario Wind Engine & Pump Co., Toronto.

Galvanizing and Tinning Machinery and Furnaces (Wire)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.

Gas and Gasoline Engines

Economic Power, Light & Heat Supply Co., Ingersoll
Morrison, T. A. & Co., Montreal.
Smart-Turner Machine Co., Hamilton, Ont.

Gauges (Recording Pressure)

Bristol Co., Waterbury, Conn.

Gauges (Steam)

Petrie, H. W., Toronto.
Williams, A. R. Machinery Co. Toronto

Gauges (Water)

Babcock & Wilcox, Limited, Montreal

Generating Sets

Sturtevant, B. F. Co., Hyde Park, Mass

Generators

Allis-Chalmers-Bullock, Limited, Montreal
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont
Electrical Construction Co., London, Ont
Forman, John, Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto
Phillips, Eugene F., Electrical Works, Montreal
Toronto & Hamilton Electric Co., Hamilton, Ont.

Gloves, Mittens and Moccasins

Storey, W. H. & Son, Acton, Ont.

Government Notices

Factory Inspectors.
Minister of Agriculture.

Graphite

Dixon, Jos. Crucible Co., Jersey City, N.J.
Hamilton Facing Mill Co., Hamilton, Ont.
McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Hames.

McKinnon Dash & Metal Works Co., St. Catharines

Hardware

Butterfield & Co., Rock Island, Que.
Gartshore, John J., Toronto.
Globe Machine & Stamping Co., Cleveland, Ohio
Hopkins, F. H. & Co., Montreal.
Morrow John Machine Screw Co., Ingersoll, Ont

Heating and Ventilating Apparatus

Darling Bros. Montreal.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Hoisting Engines

Allis-Chalmers-Bullock, Limited, Montreal.
Jenckes Machine Co., Sherbrooke, Que

Hoists (Chain and Pneumatic)

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian Rand Drill Co., Sherbrooke, Que.
Hopkins, F. H. & Co., Montreal.

Hose (Fire and Pneumatic)

Gutta Percha & Rubber Mfg. Co., Toronto.

Hydrants

Kerr Engine Co., Walkerville, Ont.
Jenckes Machine Co., Sherbrooke, Que
McDougall, John, Caledonian Iron Works Co. Montreal.

Hydraulic Accumulators

Jenckes Machine Co., Sherbrooke, Que
McDougall, John, Caledonian Iron Works Co. Montreal.
Smart-Turner Machine Co., Hamilton, Ont.

Hydraulic Machinery

Canada Foundry Co., Toronto.
Darling Bros., Montreal.
Hamilton, Wm. Mfg. Co., Peterborough, Ont
Jenckes Machine Co., Sherbrooke, Que
McDougall, John, Caledonian Iron Works Co. Montreal.
Perrin, William R. & Co., Limited, Toronto.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.

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Insulated Wires and Cables

Phillips, Eugene F., Electrical Works, Montreal.

Iron and Steel Specialties

Armstrong Mfg. Co., Bridgeport, Conn.
Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Leslie, A. C. & Co., Montreal.
London Rolling Mill Co., London, Ont.
Lysaght, John, Limited, Bristol, England and Montreal.
Metallic Roofing Co., Toronto.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Pedlar People, Oshawa, Ont.
Petrie, H. W., Toronto.
Union Drawn Steel Co., Hamilton, Ont.

Injectors

Canada Foundry Co., Toronto.
Hamilton Brass Mfg. Co. Hamilton, Ont.
Williams A. R. Machinery Co., Toronto.

Iron and Steel Inspection

Hunt, R. W. & Co., Chicago, Ill.

Lamps—Electric

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Forman, John, Montreal.
Packard Electric Co., St. Catharines, Ont.

Lathes

Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Lathes (Wood-working)

Goldie & McCulloch Co., Galt, Ont.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Lubricators

Hamilton Facing Mill Co., Hamilton, Ont.

Machinists

Goldie & McCulloch Co., Galt, Ont.
Robb Engineering Co., Amherst, N.S.
Smart-Turner Machine Co., Hamilton, Ont.

Machinists' Supplies

Armstrong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Rock Island, Que.
Goldie & McCulloch Co., Galt, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Hopkins, F. H. & Co., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Morrow, John, Machine Screw Co., Ingersoll Ont.
Petrie, H. W., Toronto.

Machine Tools

Becker-Brainard Milling Machine Co., Hyde Park, Mass.
Darling Bros., Montreal.
Petrie, H. W., Toronto.

Malleable Castings

McKinnon Dash & Metal Works Co., St. Catharines, Ont.
Smith's Falls Malleable Castings Co., Smith's Falls, Ont.

Marine and Stationary Engines and Boilers

Allis-Chalmers-Bullock, Limited, Montreal.
Jenckes Machine Co., Sherbrooke, Que.
Smart-Turner Machine Co., Hamilton, Ont.

Mechanical Draft

Babcock & Wilcox, Limited, Montreal.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Metal Doors

Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont

Metal Stamping

Globe Machine & Stamping Co., Cleveland, Ohio.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Metallurgists

Mills, S. D., Toronto

Mill Machinery and Supplies

Allis-Chalmers-Bullock, Limited, Montreal.
Armstrong Mfg. Co., Bridgeport, Conn.
Becker-Brainard Milling Machine Co., Hyde Park, Mass.
Darling Bros., Montreal.
Gartshore, John J., Toronto.
Goldie & McCulloch Co., Galt, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Hamilton Brass Mfg. Co., Hamilton, Ont.
Hamilton, Wm., Mfg. Co., Peterborough, Ont.
Hay, Peter Knife Co., Galt, Ont.
Hopkins, F. H. & Co., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.
Morrow, John, Machine Screw Co., Ingersoll, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
McLaren, D. K., Montreal and Toronto.
Petrie, H. W., Toronto.
Robb Engineering Co., Amherst, N.S.
Smart-Turner Machine Co., Hamilton, Ont.
Spence, R. & Co., Hamilton, Ont.

Milling Cutters and Machines

Becker-Brainard Milling Machine Co., Hyde Park, Mass.

Miners' Lamps

Allis-Chalmers-Bullock, Limited, Montreal.

Mining Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian Rand Drill Co., Sherbrooke, Que.
Gartshore, John J., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Hopkins, F. H. & Co., Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co, Montreal.
Perrin, William R. & Co., Limited, Toronto.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

Motors and Dynamos

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont.
Electrical Construction Co., London, Ont.
Forman, John, Montreal.
Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Keystone Engineering Co., Toronto.
Petrie, H. W., Toronto.
Sturtevant, B. F. Co., Hyde Park, Mass.
Toronto & Hamilton Electric Co., Hamilton, Ont.

Moulding Sand

Hamilton Facing Mills Co., Hamilton, Ont.

Moulders Supplies.

Hamilton Facing Mill Co., Hamilton, Ont.

Municipal Filtration Plants (Water)

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Nickel

Canadian Copper Co., New York, N.Y.
Orford Copper Co., New York, N.Y.

Nozzles

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Office and Bank Fittings

Canadian Office & School Furniture Co., Preston, Ont.

Oils and Lubricants

Dixon, Jos. Crucible Co., Jersey City, N.J.
Hamilton Facing Mill Co., Hamilton, Ont.
Imperial Oil Co., Petrolea, Ont.
Queen City Oil Co., Toronto.

Oil Cloth

Dominion Oil Cloth Co., Montreal.

Paints and Colors

Berry Bros., Walkerville, Ont.
McArthur, Corneille & Co., Montreal.

Paper Manufacturers

Barber, Wm. & Bros., Georgetown, Ont.
Toronto Paper Mfg. Co., Cornwall, Ont.

Patents

Budden, Hanbury A., Montreal.
Fetherstonhaugh & Co., Toronto.
Marion & Marion Montreal.

Patterns (Wood and Iron)

Maxwell, David & Sons, St. Mary's, Ont.

Perforated Metals

Globe Machine & Stamping Co., Cleveland, Ohio
Groening, B. Wire Co., Hamilton, Ont.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Personal Accident

Canadian Casualty & Boiler Insurance Co., Toronto

Phosphorizers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Piano Action and Key Machinery

Gearing, H., Toronto.

Pig Iron

Bourne-Fuller Co., Cleveland, Ohio.
Canada Iron Furnace Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Syracuse Smelting Works Montreal.

Pipe (Riveted, Iron and Steel)

Babcock & Wilcox, Limited, Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.

Pipe Threading Machines

Armstrong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Rock Island, Que.
Petrie, H. W., Toronto.

Pipes and Tubes

Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Montreal Pipe Foundry Co., Montreal.

Plaster

Albert Mfg. Co., Hillsborough, N.B.

Plates

Bourne-Fuller Co., Cleveland, Ohio.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Plumbago

Hamilton Facing Mills Co., Hamilton, Ont.
McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Pneumatic Tools

Allis-Chalmers-Bullock, Limited, Montreal.
Canadian Rand Drill Co., Sherbrooke, Que.
Hamilton Facing Mill Co., Hamilton, Ont.

Pointed Rolls (For Rods and Wire)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio

Power Plants—Equipments

Allis-Chalmers-Bullock, Limited, Montreal.
Babcock & Wilcox, Limited, Montreal.
Canadian General Electric Co., Toronto.
Canadian Westinghouse Co., Ltd., Hamilton, Ont
Darling Bros., Montreal.
Economic Power, Light & Heat Supply Co., Toronto
Electrical Construction Co., London, Ont.
Goldie & McCulloch, Galt, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jeffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Keystone Engineering Co., Toronto
McDougall, John, Caledonian Iron Works Co., Montreal.
Packard Electric Co., St. Catharines, Ont.
Perrin, Wm. R. & Co., Limited, Toronto
Petrie, H. W., Toronto.
Phillips, Eugene F., Electrical Works, Montreal
Robb Engineering Co., Amherst, N.S.
Smart-Turner Machine Co., Hamilton, Ont.
Sturtevant, B. F. Co., Boston, Mass.
Toronto & Hamilton Electric Co., Hamilton, Ont

Presses (Tile, Sewer Pipe, Nozzles and Sleeves)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Pulleys

Darling Bros., Montreal.
Goldie & McCulloch Co., Galt, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jeffrey Mfg. Co., Columbus, Ohio.
McDougall, John, Caledonian Iron Works Co. Montreal.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.

Producer Gas Plants

Economic Power, Light & Heat Supply Co., Toronto

Pumps and Pumping Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Canada Foundry Co., Toronto.

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Darling Bros., Montreal.
Downie Pump Co., Downieville, Pa.
Goldie & McCulloch Co., Galt, Ont.
Jenckes Machine Co., Sherbrooke, Que.
Kerr Engine Co., Walkerville, Ont.
Morris Machine Works, Baldwinsville, N.Y.
McDougall, John, Caledonian Iron Works Co. Montreal.
Ontario Wind Engine & Pump Co., Toronto.
Petrie, H. W., Toronto.
Smart-Turner Machine Co. Hamilton, Ont.

Punches and Shears

Globe Machine & Stamping Co., Cleveland, Ohio.
Petrie, H. W., Toronto.

Purifiers

Babcock & Wilcox, Limited, Montreal.
Goldie & McCulloch Co., Galt, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.

Purifying and Softening Systems (Water)

Babcock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.

Railroads

Chicago & North-Western Ry., Toronto and St. Paul, Minn.

Railway Supplies

Algoma Steel Co., Sault Ste. Marie, Ont.
Allis-Chalmers-Bullock, Limited, Montreal.
Gartshore, John J., Toronto.
Greening, B. Wire Co., Hamilton, Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Hopkins, F. H. & Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Phillips, Eugene F. Electrical Works, Montreal.

Reamers

Butterfield & Co., Rock Island, Que.

Rivets

Bourne-Fuller Co., Cleveland, Ohio.
London Rolling Mills, London, Ont.

Rock and Ore Crushers

Allis-Chalmers-Bullock, Limited, Montreal.
Bradley Pulverizer Co., Boston, Mass.

Rolling Mill Engineers

Bourne-Fuller Co., Cleveland, Ohio.

Roofing

Bourne-Fuller Co., Cleveland, Ohio.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Rubber Goods

Gutta Percha & Rubber Mfg. Co., Toronto.

Rubber Packing

Gutta Percha & Rubber Mfg. Co., Toronto.

Rubber Washing Tubs

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Rural Mail Boxes

Globe Machine & Stamping Co., Cleveland, Ohio.

Saddlery Hardware

McKinnon Dash & Metal Works Co., St. Catharines, Ont.

Safes and Vaults

Goldie & McCulloch Co., Galt, Ont.

Saw Mill Machinery

Allis-Chalmers-Bullock, Limited, Montreal.

Screws

Morrow, John, Machine Screw Co., Ingersoll, Ont.

Screw Plates

Armstrong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Rock Island, Que.

Sewer Pipes.

Dominion Sewer Pipe Co., Swansea, Ont.

Shafting

Allis-Chalmers-Bullock, Limited, Montreal.
Bourne-Fuller Co., Cleveland, Ohio.
Goldie & McCulloch Co., Galt, Ont.
Jeffrey Mfg. Co., Columbus, Ohio.
McDougall, John, Caledonian Iron Works Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.

Shear Knives

Hay, Peter Knife Co., Galt, Ont.

Sheets (Iron and Steel)

Bourne-Fuller Co., Cleveland, Ohio.
Leslie, A. C. & Co., Montreal.
Lysaght, John, Limited, Bristol, England, and Montreal.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Sheet Metal Goods

Globe Machine & Stamping Co., Cleveland, Ohio.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Sheet Metal Stamping

Globe Machine & Stamping Co., Cleveland, Ohio.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.

Shovels.

Hamilton Facing Mill Co., Hamilton, Ont.

Smoke Stacks

Gearing, H., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
Robb Engineering Co., Amherst, N.S.
Smart-Turner Machine Co., Hamilton, Ont.

Solder

Globe Machine & Stamping Co., Cleveland, Ohio.
Syracuse Smelting Co., Montreal.

Special Machinery

Allis-Chalmers-Bullock, Limited, Montreal.
Globe Machine & Stamping Co., Cleveland, Ohio.
Smart-Turner Machine Co., Hamilton, Ont.

Speed Recorders

Bristol Co., Waterbury, Conn.

Sprinkler Insurance

Canadian Casualty & Boiler Insurance Co., Toronto.

Stamps and Stencils

Globe Machine & Stamping Co., Cleveland Ohio.

Steam Pumps

Allis-Chalmers-Bullock, Limited, Montreal.
Canada Foundry Co., Toronto.
Darling Bros., Montreal.
Goldie & McCulloch Co., Galt, Ont.
McDougall, John, Caledonian Iron Works Co., Montreal.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.
Williams, A. R. Machinery Co., Toronto.

Steam Separators

Babcock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
Robb Engineering Co., Amherst, N.S.
Sheldon & Sheldon, Galt, Ont.
Smart-Turner Machine Co., Hamilton, Ont.

Steam Shovels

Allis-Chalmers-Bullock, Limited, Montreal.

Steam Specialties

Darling Bros., Montreal.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Hyde Park, Mass.

Steam Valves

Babcock & Wilcox, Limited, Montreal.
Darling Bros., Montreal.
Kerr Engine Co., Walkerville, Ont.
Petrie, H. W., Toronto.
Williams A. R. Machinery Co., Toronto.

Steel Rails

Algoma Steel Co., Sault Ste. Marie, Ont.
Drummond, McCall & Co., Montreal and Toronto.
Gartshore, John J., Toronto.
Hopkins, F. H. & Co., Montreal.

Steel Shafting

Darling Bros., Montreal.
Goldie & McCulloch Co., Galt, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Leslie, A. C. & Co., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.
Nova Scotia Steel & Coal Co., New Glasgow, N.S.

Stocks and Dies

Armstrong Mfg. Co., Bridgeport, Conn.
Butterfield & Co., Rock Island, Que.
Petrie, H. W., Toronto.

Stoppers

McCullough-Dalzell Crucible Co., Pittsburg, Pa.

Structural Steel

Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.
Hopkins, F. H. & Co., Montreal.

Sulphate of Alumina

Nichols Chemical Co. of Canada, Montreal.

Suspension Furnaces

Continental Iron Works Co., New York City.

Tanks (Oil and Water)

Canada Foundry Co. Toronto.
Goldie & McCulloch Co., Galt, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal.
Ontario Wind Engine & Pump Co., Toronto.

Taps and Dies

Butterfield & Co., Rock Island, Que.
Globe Machine & Stamping Co., Cleveland, Ohio.

Tees

Bourne-Fuller Co., Cleveland, Ohio.
Canada Foundry Co., Toronto.

Textile Manufacturers

Dominion Oil Cloth Co., Montreal.
Storey, W. H. & Sons, Acton, Ont.

Thermometers (Recording)

Bristol Co., Waterbury, Conn.

Tin

Leslie, A. C. & Co., Montreal.
Syracuse Smelting Works, Montreal.

Tool Steel

Bourne-Fuller Co., Cleveland, Ohio.
Hopkins, F. H. & Co., Montreal.
Leslie, A. C. & Co., Montreal.

Trucks

Hopkins, F. H. & Co., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.
Sheldon & Sheldon, Galt, Ont.

Trucks (Railway)

Canada Foundry Co., Toronto.

Trucks (Wire Mill Supplies)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Tubs (Cleaning and Coating Wire)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Tumbling Barrels

Globe Machine & Stamping Co., Cleveland, Ohio.
Petrie, H. W., Toronto.
Smart-Turner Machine Co. Hamilton, Ont.

Turbines

Canada Foundry Co., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Jenckes Machine Co., Sherbrooke, Que.

Valves

Babcock & Wilcox, Limited, Montreal.
Canada Foundry Co., Toronto.
Hamilton Brass Mfg. Co., Hamilton, Ont.
Kerr Engine Co., Walkerville, Ont.
Petrie, H. W., Toronto.
Smart-Turner Machine Co., Hamilton, Ont.
Williams, A. R. Machinery Co., Toronto.

Valves (Rubber)

Gutta Percha & Rubber Mfg. Co., Toronto

Varnishes

Berry Bros., Walkerville, Ont.

Ventilators

Darling Bros., Montreal.
Metallic Roofing Co., Toronto.
Pedlar People, Oshawa, Ont.
Sheldon & Sheldon, Galt, Ont.
Sturtevant, B. F. Co., Boston, Mass.

Wagon and Carriage Wood Work

Hore, F. W. & Son, Hamilton, Ont.

Washers or Hollinders (Cleaning Rubber)

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Water Power Development

Vogel, C. H., Ottawa.

Water Purifying Chemicals

Canada Chemical Mfg. Co., London, Ont.
Canada Process Co., Toronto.

Water Softening Plants

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

Wheelbarrows.

Hamilton Facing Mill Co., Hamilton, Ont.

Windmills

Ontario Wind Engine & Pump Co., Toronto.

Wiping Rags for Waste

Schienman, I. L. & Co., Detroit, Mich.

Wire Mill Supplies

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Wire and Wire Rope

Dominion Wire Rope Co., Montreal.
Greening, B. Wire Co., Hamilton, Ont.
Leslie, A. C. & Co., Montreal.
Phillips, Eugene F. Electrical Works Montreal.

Wire Rope Fittings

Dominion Wire Rope Co., Montreal.

Wire Cloth

Greening, B. Wire Co., Hamilton, Ont.

Wire Drawing Machinery

Turner, Vaughn & Taylor Co., Cuyahoga Falls, Ohio.

Wood-Working Machinery

Goldie & McCulloch Co., Galt, Ont.
Petrie, H. W., Toronto.
Sheldon & Sheldon, Galt, Ont.
Williams, A. R. Machinery Co., Toronto.

Zinc

Leslie, A. C. & Co., Montreal.
Syracuse Smelting Works, Montreal.

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