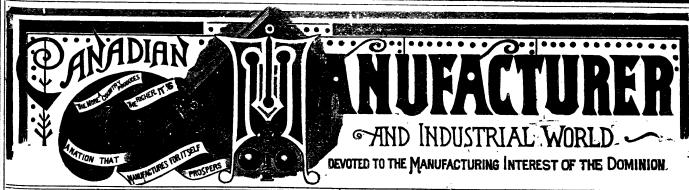
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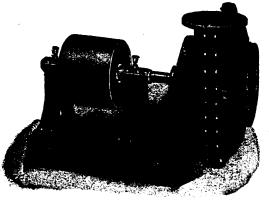
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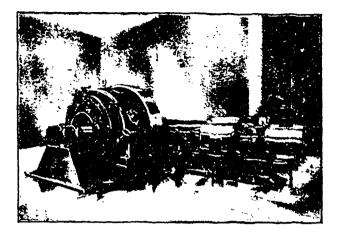
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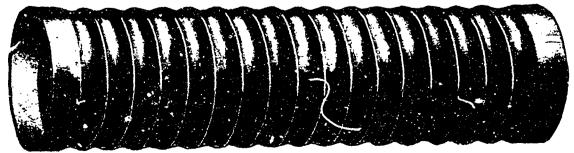


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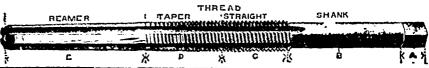
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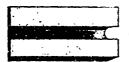
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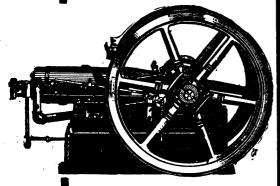
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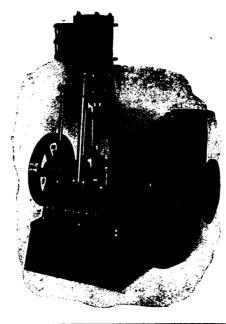
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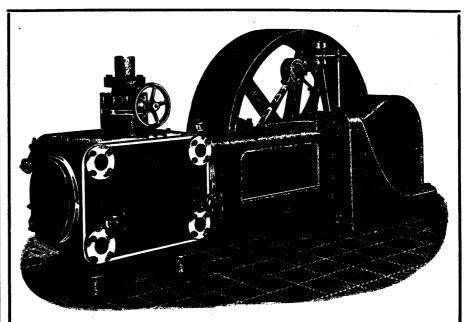
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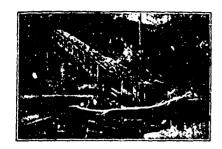
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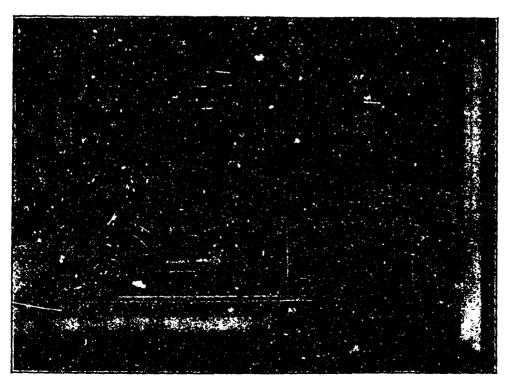
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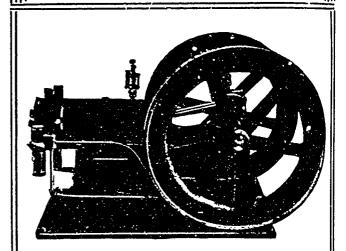
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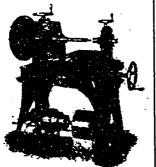
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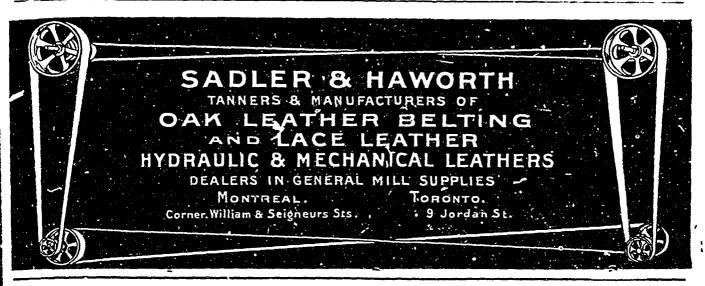
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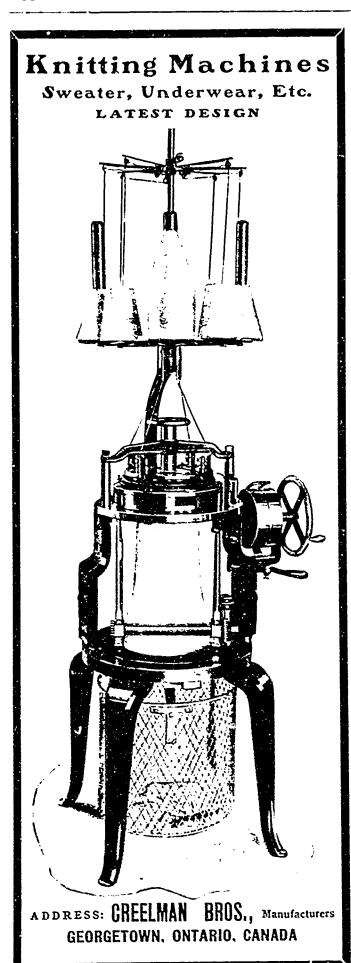
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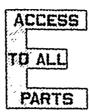
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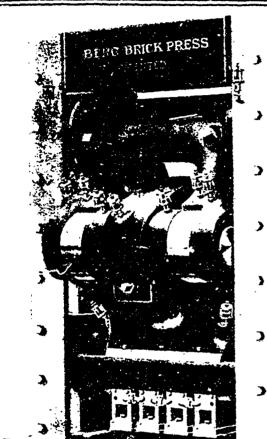


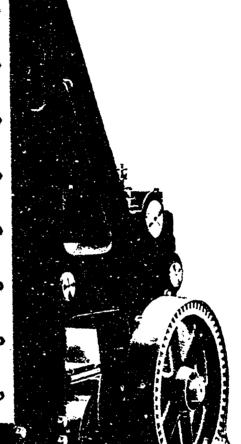












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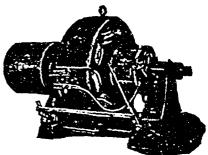
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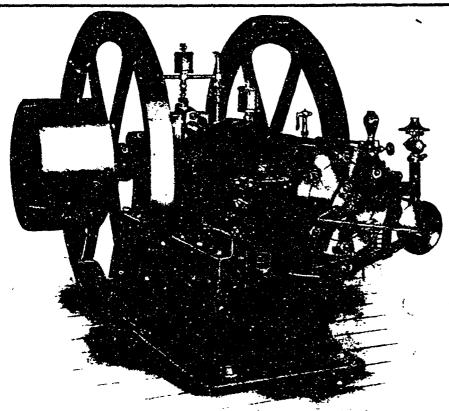
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# BRITISH EXPORTS AND CANADIAN IMPORTS OF TEXTILES.

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 \$0.0 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 the care 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	C	anada.	British_Imports					
British re	tu	rns.	Canadiar	ı 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 fabries 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:

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

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

To Foreign Countries To British Possessions.	1901. £175,148,555 104,873,821	
	£280,022,376	

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 Manufacturen from the Official Annual Statements of the Trade of the United Kingdom with Foreign Countries and British Possessions.

### TOTAL EXPORTS.

		TOTAL EX.				
		All Countries.	Canada.	All British Possessions.	United States.	All Foreign Countries.
Apparel, not water-proofed.	1901	£5,571,259	£281,100	£4,841,850	£74,752	£729,400
	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
Apparel, other material not water-proofed	1905	2,323,115	173,646 Not enumerated	1,918,014	Not onumerated	405,101 Not enumerated
reparet, other aniceral not meet proofeet	1905	2,219,956	92,821	1,919,279	37,306	300,677
Cotton yarn for weaving, grey		6,110,852	52,701	944,663	192,296	5,166,189
Cotton yarn, bleached and dyed	1905	8,223,400	32,566	1,075,591	288,627	7,147,809
Cotton yann, bienenet and dyed	1905	1,866,180 2,095,154	11,782 26,547	1,042,170 1,203,677	81,722 118,082	824,010 891,147
Cotton piece goods, grey		18,309,323	61,433	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 19,033,712	83,200	7,899,985	343,262	7 798,961
Cotton goods, printed.	1901	10,349,455	178,349 195,953	7,910,115 4,221,924	516,488 135,374	11,123,597 6,127,531
-	1904	12,556,710	244,824	5,270,793	106,541	7,285,919
Cotton goods, dyed		12,143,003	289,436	4,394,784	779,327	7,748,219
Cotton lace and net	1905 1901	17,276,482 2,666,819	402,914 239,395	5,521,026 660,321	1,314,655 1,067,419	11,755,456 2,006,498
Anton face and netters.	1905	3,736,908	302,995	812,685	969,410	2,000,458 2,918,223
Cotton hosiery, stockings, etc.	1901	222,637	5,648	197,981	8,028	24,656
man and the America California Patricia	1905	157,028	4,532	131,897	7,980	25.131
Cotton hosiery, other kinds	1901 1905	197,345 360,828	39,925 71,902	135,559 280,742	19,537   15,374	61,786 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
Potton goods unenumerated		2,529,108	105,284	1,125,381	127,944	1,403,727
Haberdashery	1905 1901	3,240,623 1,460,316	156,850 125,401	1,287,699   1,235,481	173,824 22,118	1,952,927 224,835
1anethener,	1905	1,265,603	202,892	1,039,005	19,165	226,598
Tats 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
ute yarn	1901 1905		Not enumerated Not enumerated	8,383   9,461	9,623   31,924	<i>5</i> 06,220 591,311
uto 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
ute, other manufactures of.	1901	69,803	1,219	36,154	1,430	33,649
inen yarn	1905 1901	,99,932 824,681	3,036   3,478	33,703   12,442	4,568   41,746	66,229 812,239
_	1905	927,617	15,182	24,233	58,533	903,384
inen piece goods plain	1901	3,242,487	163,756	550,299	1,903,730	2,692,188
inen piece goods, printed, damask, drapier, etc.	1905	4,225,394 240,375	221,160   11,834	663,179 59,950	2,384,543   23,521	3,562,215 180,416
anen plece goods, printed, damask, drapter, etc.	1905	335,635	11,043	72,286	30,877	263,349
inen sail cloth	1901	254,212	None	132,122	4,549	122,090
	1905	280,840	None	102,859	4,917	177,981
inen sewing thread	1901	227,119 262,396	30,456 28,672	82,786 83,928	30,223   36,115	144,333 178,468
inen 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
il and floor cloth	1901	1,298,007	69,808	520,864	118,388	777,143
ilk twist or yarn.	1905	1,752,005   294,311	127,586   1,151	624,780 294,311	254,469   73,774	1,127,225 212,468
	1905	285,705	5,221	61,784	95,968	223,921
ilk and satin broadstuffs	1901	492,297	21,375	70,272	35,388	422,025
	1905	798,727	19,720	56,227	35,849	7 12,500
ilk handkerchiefs, etc	1901	181,452   138,271	6,985   3,110	132,546 89,059	5,996   6,811	48,906 19,212
ilk ribbons, all kinds.		27,590	9,383	23,124	695	4,456
42223	1904	14,973	2,078	10,083	360	4,890

TOTAL EXPORTS—(Continued.)

	101	AL EXPORTS	-(Continued.)	<u></u>		
		All Countries.	Canada.	All British Possessions.	United States.	All Foreign Countries.
Siik lace and manufactures of.	1901	£98,772	£2,556	£15,950	£31,046	£82,822
	1905	72,761		17,288	19,784	55,476
Silk unenumerated	1901 1901	185,429 287,914		84,097 117,267	12,109 77,970	101,332 170,047
Silk mixed, broadstuffs	1901	376,837		124,180	81,665	252,677
· i	1905	406,006	87,304	135,188	29,837	270,818
Silk mixed, other kinds.	1901 1905	67,001 318,037	7,967     21,827	20,002 - 174,389	36,800 1 20,029	47,002 143,648
Woolen yarn	1903	92.090	7,952	34,510	992	57,580
•	1905	188,693	27,312	64,127	1,221	124,566
Worsted yarn	1901 1905	3,395,596	31,483	68,634	1,573   3,912	3,326,962 3,854,854
Alpaca and mohair yarn		4,055,256 1,599,983	143,391 Not enumerated	200,402 166	Not enumerated	1,599,817
-	1905	1,690,647	Not enumerated	527	Not enumerated	1,690,120
Hair or wool yarn, n.e.s.			Not enumerated	383	Not cnumerated	150,595
All wool tissues, broad	1905	2,026,055	Not enumerated 113,700	907 384,547	Not enumerated 216,992	237,738 1,641,508
1	1905	4,475,815		1,215,364	266,792	3,260,451
Woolen tissues, mixed, broad	1901	1,269,922		360,529	14,904	909,393
All wool tissues, narrow	1905	1,676,814	288,857	468,503	23,016 16,399	1,208,311 43,373
All Wool cissues, matrow	1905	71,294 81,571	7,909 9,614	27,921 23,809	6,171	57,762
Woolen tissues, mixed, narrow		31,128	1,483	15,647	1,338	15,481
III I Alimon Maka I mad	1905	28,581	2,838	14,887	1,088	13,694
All wool tissues, light, broad	1901	928,886 1,357,772		242,168 319,627	63,050 40,822	686,718 1,038,145
Woolen tissues mixed, light, brond.	1901	529,733	28,956	189,592	4,208	340,141
· - ·	1905	990,609		433,379	10,061	557,230
All wool tissues, light, narrow	1901 1905	179,555 175,735	6,561 3,121	65,463 57,795	11,613 4,287	114,092 117,940
Woolen tissues mixed, light, narrow.		162,501	15,418	83,481	2,879	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 1,289,242
Woolen coatings mixed.	1905 1901	2,107,679 647,501	309,929 160,371	818,437 342,470	161,587 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
Worsted coatings mixed, narrow,	1905 1901	113,758 88,892	57,259 8,579	83,022 37,620	11,276 4,175	30,736 51,272
noised coatings mixed, narrow,	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
Worsted stuffs mixed.	1905	478,890		220,824 826 628	45,491   394,986	258,066 1,865,416
norsted states mixed	1901 1905	2,692,044 3,175,340	309,670 359,382	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 1905	11,175 24,737	614 1,328	3,309 4,045	437 11,492	7,866 20,692
Flannels	1903	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	405,938 537,161	50,186 53,426	424,009 439,298
Blankets.	1905 1901	976,459 297,123	311,203		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 14,698
Rugs, coverlets, etc	1905 1901	67,236 443,833	8,438 9,972	52,538 320,162	2,818 8,566	123,671
noge, concincia, occin , , ,	1905	448,775	22,247	283,308	17,938	165,467
Woolen hosicry.	1901	893,335	175,281	697,445	49,793	195,890
Waster and December 2	1905	1,190,601	289,711	948,811 99,377	53,335 16,881	241,790 142,669
Woolen smallwares, unenumerated	1901 1905	242,046 330,267	21,123 19,160	126,660	34,852	203,607
		ļ		<u>_</u>		
Totals	1901	£112,259,795	£3,913.233	£47,700,974	£8,253,294	£65,131,370 85,637,467
	1905	138,690,359	5,637,319	52,942,874	10,480,402	00,007,107
			<u> </u>		<del>!</del>	

### RECAPITULATION.

TOTAL BRITISH TEXTILE EXPORT
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British Currency.  1901. £112,259,79  1905. 138,690,35  Increase. 20,430,56  Percentage of	9 1905 675,422,03
EXPOR	TS TO CANADA.
1901 £3,913,23 1905 5,637,31 Increase. 1,724,08 Percentage	9 1905 27,453,743
ALL BRI	TISH POSSESSIONS.
1901 £47,700,97 1905 53,166,79 Increase 5,465,82 Percentage	5 1905 258,922,291
TO U	NITED STATES.
1901 £8,253,29 1905 10,480,40 Increase. 2,227,10 Percentage of	2 1905 51,039,557
TO ALL FO	OREIGN COUNTRIES.
1901	7 1905 417,051,463

# 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 Manufactures from the Trade and Navigation Tables of the Dominion of Canada

	General Tariff.	Great Britai Prèferentia		United Sta General		All Cou	ntries.
		1901.	1906.	1901.	1906.	1901.	1906.
Canvas for boats' sails	. 5 p.c.	\$2,272	\$7,655	\$93	None	\$2,896	\$7,688
Church vestments		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	4,000
Cordage, cotton	. 25 p.c.	1,450	12,107	14,156	8,351	15,653	21,279
Cordage, twines, n.e.s		27,924	155,305	48,612	82,998	78,383	240,932
Cotton, batts and batting		427	683	9,926	9,926	10,437	16,025
Cotton, knitting yarns		18,797	16,289	8,270	28,461	27,270	45,615
Cotton warps, n.e.s.		2,577	1,003	4,131	1,238	6,708	1,241
Cotton sewing thread on spools		131,239	157,071	112,020	178,402	261,125	357,016
Cotton sewing thread in hanks		376,764	383,887	83	222	377,781	384,109
Cotton sewing thread, all other, n.e.s		1,913	211	1,538	313	3,455	521
Cotton crochet thread		3,883	11,455	-11,334	9,439	15,585	20,959
Cotton thread, all other, n.e.s		1,913	211	1,538	<b>313</b>	3,455	524
Cotton seamless bags.		704	5,376	8,200	7,164	9,275	18,362
Cotton sheets and quilts		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.		88,030	232,894	190,107	370,052	314,926	673,319
Cotton blouses and waists		834	4,810	14,218	79,057	15,514	87,726
Cotton bags, n.o.p		510	7,080	29,790	56,385	30,591	63.523
Cotton lampwick		1,115	5,143	7,021	5,398	9,053	10,876
Cotton shawls		1,703	1,713	94	11	1,926	1,81
Cotton socks and stockings.		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		16,730	18,186	3,179	5,432	25,489	32,521
Cotton towels		24,746	94,721	1,343	957	27,355	97,557
Cotton undershirts and drawers.	35 p.c.	1,561	13,223	4,185	70,584	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). -

The second secon		THEORIS OF T		(continued).	i		
	General Tariff.	Great Britain Preferential		United State General'		All Coun	tries.
		1901.	1906.	1901.	1906,	1901.	1906.
Cotton velvets and plush, n.e.s.	- 80 p.c.	\$212,909	\$315,218	\$37,824	\$75,891	\$296,570	\$170,219
Cotton, other fabrics, n.o.p.	35 p.c.	20,557	53,605	13,041	112,799	73,517	199,435
Cotton crapes, black	20 p.c.	18,989	9,986	502	173	24,438	13,303
('uffs of cotton, linen, etc Curtains and shams	35 p.c.	777 274,506	851	466 55,443	724	1,301	5,150 634,191
Embroideries, n.o.p	35 p.c. 35 p.e.	9,717	101,347 12,053	6,905	75,248 8,364	136,950 56,579	84,982
Braids, cords, fringes, etc	35 p.c.	57,225	71,831	103,753	122,112	389,753	154,751
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 4,856	646 2,646	157	1,652	874 5,207	5,307 2,763
Flax sail twine	5 p.c. 30 p.c.	389,673	601,167	11,140	72 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		749	1,599	30	1	850	2,059
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 Flax, linen clothing.	25 p.c.	487,199	642,578	15,840	28,644	516,424	689,942 14,933
Flax, linen blouses and shirt waists	35 p.e. 35 p.e.	11,608 None	9,347 110	2,444	4,053 116	16,059 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 juto 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	16.290	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.e.	145,384	192,901	8,598	13,448	159,653	214,688
Clothing	* 35 p.c. 35 p.c	88,030 766	33,445 935	190,107 53,095	16,717 50,173	314,926 54,409	40,524 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	1,299,538
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 Oiled silk and cloth—flocked or coate	35 p.c.	92,625	263,834	3,652	27,254	111,043	363,997
n.o.p		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 Not enumerated	363,991 43	105,640 Not enum'ted	93,024 742	2,359,753 Not enum'ted	3,882,554 17,983
Sik for neckties, etc	10 p.c.	Not enumerated	66,110	Not enum'ted	105,942	Not enum'ted	500,938
Silk handkerchiefs	·•	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 . Silk shawls,	25 p.c. 30 p.c.	15,419	23,206 1,405	9,720 174	15,297 917	25,789 2,286	39,912 8,702
Silk shirts.	35 p.c.	485	2,036	339	3	834	2,903
Sik goods, n.o.p., n.e.s		35,329	32,815	15,667	18,228	95,262	114,176
Silk socks and stockings		1,463	4,796	None	283	1,766	8,755
Sik undershirts and drawers		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.		11,819	14,112 790	39,820	58,522 None	51,639 133,944	72,634 879
Carpeting, and matting straw	35 p.c. 25 p.c.	118,848	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 9,205	35,222	111,490
Wool coatings.	35 p.c.	2,587 496,212	1,853,932 1,116,122	984	9,205	6,812 505,813	1,977,209 1,164,929
Wool tweeds.	. 35 p.c. 35 p.c.	732,010	2,008,409	538	282	786.448	2,073,726
Weol 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 Brita Preferenti			ates under l Tariff.	All Countries.	
		1901.	1906.	1901.	1906.	1901.	1906,
Wool flannels Wool, knitted underwear, n.e.s. Wool shed comforters Wool shirts. Wool shirts. Wool socks and stockings Wool undershirts and drawers Wool yarns for factories Wool yarns, n.e.s Wool, all other fabrics, n.e.s. Wool, women's dress goods, etc Wool, women's clothing	35 p.c. 35 p.c. 35 p.c. 20 p.c. 30 p.c. 35 p.c. 25 p.c. 35 p.c.	\$51,296 54,498 827 69,546 12,368 479,189 79,870 177,743 86,967 1,928,843 28,405 Not enumerated		\$4,966 11,080 604 1,688 1,815 7,903 12,944 2,490 4,912 44,273 1,116 Not enum'ted	,	\$123,435 94,012 1,718 93,664 17,009 543,012 103,821 244,277 134,654 3,098,818 55,182 Not enum*ted	
Wool, ready-made clothing, n.e.s. Wool carpets—Brussels. Wool carpets—tapestry. Wool, n.e.s. Wool felt not filled Wool shoddy.	35 p.c. 35 p.c. 35 p.c. 35 p.c. 20 p.c. 20 p.c.	371,760 407,302 458,937 Not enumerated 21,221 3,178	377,999 460,335 560,093 515,439 18,955 39,914	164,596 3,709 4,669 Not enum'ted 40,865 393	262,316 1,554 587 3,362 40,893 552	952,812 417,133 475,683 Not enum'ted 182,550 3,571	789,516 468,022 564,599 541,694 195,515 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.	1306.	1901.	1906.	1901.	1906.
Silk—raw Silk in the gum	Not enumerated	Not enum'ted \$222	\$261,637 924	\$425,446	\$261,637 924	\$451,707
Flax—fibre	Not enumerated	2.402	834	1,051	834	1,273 5,978
Vogotable fibres nes	21 000	3,463 1,677	22,390	2,515 24,766	24,519	28,337
Vegetable fibres, n.e.s Binder twine	Not anymerated	21,818	928,096	1,628,923	928,096	1,650,741
Bolting cloth.		21,010	6,387	17.034	6,709	17,593
Bookbinders' cloth.		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.		Not enum'ted		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		1,185	4,731,812	7,596,729	4,773,993	7,626,625
Duck for belting and hose.		168	102,279	118,169	102,313	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	843,850
Jute yarn.		258,807	43,210	32,085	133,428	290,892
Mohair lastings for buttons		271	208	2.184	1,145	5,326
Yarn—botany	Not enumerated	91,810	Not enum'ted		Not enum'ted	
Yarn, cotton No. 40	Not enumerated	304,979	Not enum'ted		Not enum'ted	
	Not enumerated	Not enum'ted	Not enum'ted	1,499	Not enum'ted	
	Not enumerated		Not enum'ted		Not enum'ted	
Yarn, mohair		1,243	50	157	755	1,400
Yarn, alpaca for braid	3,160	63		Not enum'ted		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. Increase from United States, \$4,122,599. Increease from All Countries, \$5,009,491.

80.0 per cent. 64.2 per cent. 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  $1\frac{1}{2}$  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-te 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.

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

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 sawmill at Dryden, Ont.

When the sawmill at Harrison River, on 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

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,

Mr. Bullis, Trenton, Ont., will erect a

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 secondhand 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,

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

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, \$125,000.

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

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, Mon-

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 Sentember 20. Loss about \$7,000.

The Quebec government will erect a new were destroyed by fire recently. Loss about 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, The Standard Bank of Canada has opened | manufacturers' agents, have been organized | manufacturers, Winnipeg, Man., will erect a to handle all kinds of iron and wood-working branch building at Calgary, Alta.

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,

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

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

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

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 nanager, 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

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,

### 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, to 12,000. The generators and exciters will and subsidiary powers." The capital stock be controlled by motor-operated rheostats 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.\*

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

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

I do not think that anyone to-day seriously | 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

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 "air-gap" or the space that is left between bearing, a short-circuited motor, and a stop-

<sup>\*</sup> 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

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 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 re sulted 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 ME-CHANISMS.

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 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 it was impossible to find out at first what the system or some other means of lightening the 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 STRUC-TURAL 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 11 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 (O H)2, which, being a very unstable product, was quickly converted in the air into Fe<sub>2</sub>O<sub>3</sub> (H,O).

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 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

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 com-position 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, The third experiment was, however of the furthermore, that the cathode is protected by greatest importance, owing to the fact that 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 onehorse 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.

The rapid and widespread growth of the for the business (The Berg) and the hardening 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

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

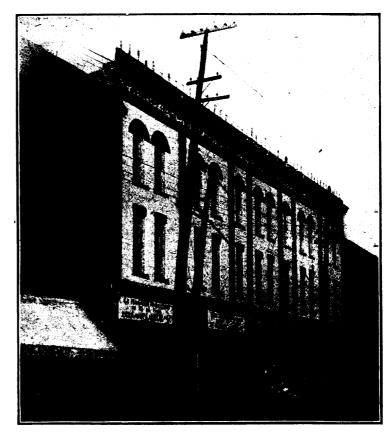
of the material under heavy steam pressure, produces in ten hours time a brick that is ready for the market, one which "rings like a bell," when tapped with a hammer, each of an even size, with a face as perfect as a straight edge, square corners and of a uniform color.

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

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



A STORE FRONT OF SAND-LIME BRICK.

in use in the United States and Canada, difference in the mixture, the percentage of 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 depen-dant for quality upon the installation of the proper machinery.

sand and lime being the same at all times.

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-anddown 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

<sup>\*</sup>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.

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 sandlime 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 sandlime brick in the School of Practical Science, Toronto, Ont., May 23, 1906, and presented Sand-Lime Pressed Brick Co. to Robert Kennedy, manager, Canada Sand-

full with loaded cars of brick, the head of the Lime Pressed Brick Co., Toronto Junction,

"The brick submitted was one made of by you. The brick were soaked in water sand and lime, on which I beg to submit the for about two days, and were then placed following report after test:

Size of brick, 8 7-16x4x2% inches. Area of surface exposed, 331 square inches.

ļ			Max. Load.	road bered m
Sample	No	. 1 said to be 2 months old	. 120.000	3.555
"	"	2 per Mr. Riddell	. 82.600	2.428
"		3 after soaking		2.311
"		4 (Culled brick) per Mr. Riddell		1.185
"		5 said to be week old		3.140
"		6 same as No. 1		3.526
"		7 settled on edge		1.715
		Vours truly		Laing."

"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.,

"Toronto, June 4, 1906.

"Mr. Robert Kennedy, manager Canada

"Dear sir,-I have completed a test of a

Test on Fusibility of Sand-Lime Brick. | 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,

sample of three bricks which you left with

me some time ago, along the lines suggested

in our freezing room, which is carried at a

"Secretary The Harris Abattoir Co., Limited."

CORROSIVE TEST MADE IN THE UNITED STATES.

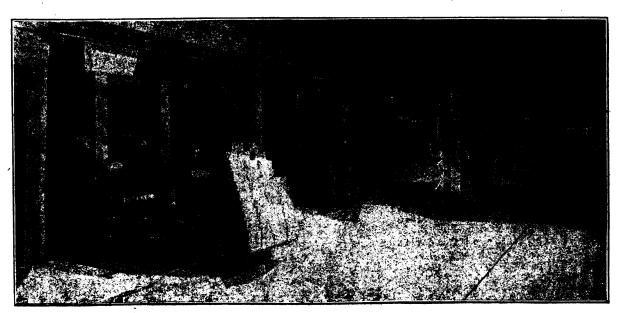
Sand-lime brick was exposed to the corrosive action of the moist atmosphere containing sulphuric, nitric, and carbonic acids for a period of 16 days and washed with clean water daily without any effect on sand-lime brick.

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., periods. No effect from this test on sandfor one-half hour and it showed no bad lime brick. effect or indication of fusion.

The same test as above was made with

CRUSHING STRENGTH PER SQUARE INCH:

		After freezing.
	k (common)2,718 pounds.	3,023 pounds.
. " " "	(face)6,025 "	6,765 "
Clay brick	(salmon)2,325 "	2,216 "
a .a	(hard B)4,288 "	4,577 "
" "	(re pre)4,469 "	4,566 "
Indiana sandst	one4,152 "	5,561 "
	FREEZING TEST.	
	Loss by v	veight.

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.)..... 0.22Indiana 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 sulphurated hydrogen and produced no drying for 48 hours at a temperature of effect on sand-lime brick. 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

### 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 at- the action of strong acids and that no atwould be subject to alternate dry and wet disintegrate 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 sandlime 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 mosphere in chemical works where brick mospheric conditions are likely to corrode or

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. 15 to 20 per cent. higher than 5,561 pounds. above tests.

Clay Brick. Sal. 5 per cent. lower. H.B. 5 " " higher R.P. 5 " " " higher.

ABSORPTION TEST.

Sand-Lime Brick. Indiana Sandstone. 3 to 15 per cent. 5.65 per cent.

Clay Brick. Sal. 17 to 30 per cent. H.B. 9 to 20 " " R.P. 10 to 15 "

FREEZING TEST. freezing at 5 degrees F., for 16 hours, immers-Less than one-half per cent. loss by weight after freezing in distilled water for 48 hours, 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 on deterioration. 0.18 0.22

(Salmon). (Hard Burned). a 👔 🦠 a (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,

### 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 121 k.w. dynamo. According to The Engineer, of London, a 5-inch bed of concrete was first laid down, on which ten 3 by 41-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.

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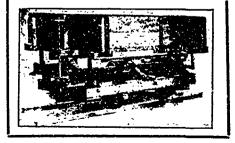
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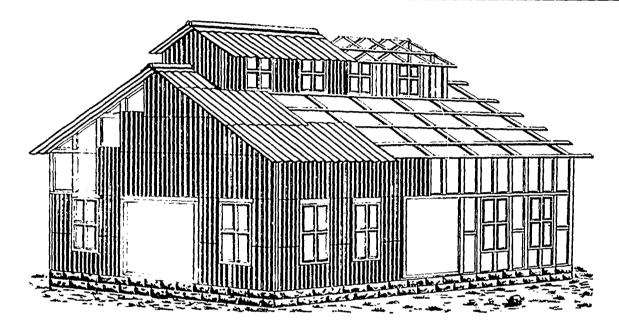
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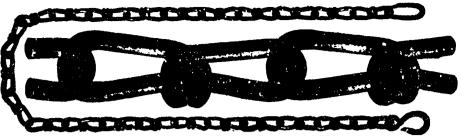
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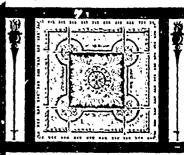
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#### Aluminum

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Winn & Holland, Montreal.

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Elk Fire Brick Co., St. Mary's, Pa.
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Ont.

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Brunner, Mond & Co., Northwich, England.
Canada Chemical Mfg. Co., London, Ont.
Canada Process Co., Toronto.
Oassella Color Co., New York City.
McArthur, Corneille & Co., Montreal.
Wichols Chemical Co. of Canada, Montreal.
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Packard Electric Co., St. Cathannes, Ont.
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Fensom, C. J., Toronto.
Gearing, H., Toronto.
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Parke, R. J., Toronto.
Perrin William R. & Co., Limited, Toronto.
Vogel, C. H., Ottawa.

#### Engineers (Contracting)

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

#### Engineers (Electrical)

Engineers (Electrical)

Altken, 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.
Keyatone Engineering Co., Toronto.
Marion & Marion, Montreal.
Toronto & Hamilton Electric Co., Hamilton, Ont.

#### Engineers (Mechanical)

Allis-Chalmers-Bullock, Limited, Montreal.
Baboock & Wilcox, Limited, Montreal.
Barling Bros., Montreal.
Electrical Construction Co., London, Ont.
Fensom, C. J., Toronto.
Gearing, H., Toronto.
McDougall, John, Caledonian Iron Works Co., Montreal.

real.

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 Hydraulio)

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. Jenekes Machine Co., Sherbrooke, Que. Smart-Turner Machine Co., Hamilton, Ont.

#### Engines and Bollers

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. Jenekes Machine Co., Sherbrooke, Que. Morris Anchine Works, Baldwinsville, N.Y McDougall, John, Caledonian Iron Works Co., Montreal.
Petrie, H. W., Torunto.
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, Gait, Ont. Sturtevant, B. F. Co., Hyde Park, Mass.

#### Factory Sites

(See Factory Locations, page 31.)

#### Feed Water Heaters

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.

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

#### Fillet (Pattern)

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

#### Filters (011)

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., Mont-real

Pittsburg Filter Mfg. Co., Pittsburg, Pa.

#### Financial

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

#### Finials

Metallia 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.
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 Broa., Montreal.

#### Fireproof Fartitions

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.

#### Pounders

Canada Foundry Co., Torohto.
Goldie & McCulloch Co., Galt. Ont.
Hamilton. Wm. Mfg. Co., Peterberough, Ont.
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John. Caledonian Iron Works Co., Mont-

real. Robb Engineering Co., Amherst, N.S. Smart-Turner Machine Co., Hamilton, Ont.

#### Foundry Facings and Supplies Hamilton Facing Mill Co., Hamilton, Ont.

#### Fuel Economizers

Bahcock & Wilcox, Limited, Montreal, Sturtevant, B. F. Co., Hydo Park, Mass.

Furniture (Lodge, Opera and Schools Canadian Office & School Furniture Co., Preston, Cr.

Ontario Wind Engino & Pump Co., Toronto.

#### Galvanizing and Tinning Machinery and Furnaces (Wire)

Turner, Vaughn & Taylor Co., Cuyahoga I alls (2.

#### Gas, and Gasoline Engines

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

#### Gauges (Recording Pressure) Bristol Co., Waterbury, Conn.

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

Gauges (Water)

Babcock & Wilcox, Limited, Montreal

#### Generating Sets

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

Generators

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

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. Catherine.

#### Hardware

Batterfield & Co., Rock Island, Que. Gartahore, John J., Toronto. Globe Machine & Stamping Co., Clevelard, Ohio Hopkins, F. H. & Co., Montreal, Morrow John Machine Serew Co., Ing. roll, Ott

#### Heating and Ventilating Apparatus

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

#### Hoisting Engines

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

#### Hoists (Chain and Pneumatic)

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

Hose (Pire and Pneumatic) Gutta Percha & Rubber Mig. Co., Toronto.

#### Hydrants

Kerr Engine Co., Walkerville, Ont.
Jenekes Machine Co., Sherbrooke, Cur
McDougall, John, Caledonian Iron Works Co. Kat
real.

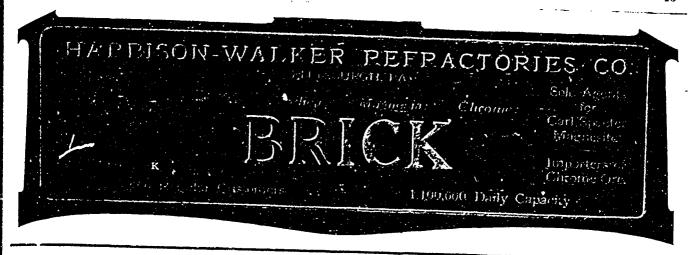
#### Hydraulic Accumulators

Jenckes Machine Co., Sherbrooke, Que McDougall, John, Caledonian Iron Werks Ca. Kel-real. Smart-Turner Machine Co., Hamilton, Ont.

#### Hydraulic Machinery

Canada Foundry Co., Toronto.
Darling Broa., Montreal.
Hamilton, Wm. Mig. Co., Peterboretyh. Onl
Jenekes Machine Co., Sherbrooke, Que
McDougall, John, Caledonian Iron Works Co., Rereal.
Perrin, William R. & Co., Limited, 1-ronto.
Petrie, H. W., Toronto.
Smart-Turner Machino Co., Hamilt., Ont.

When writing to Advortisers kindly mention THE CANADIAN MANUFACTURES.





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(CONTINUED).

#### 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.
Mrtallie 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.

#### Intectors

Canada Foundry Co., Toronto. Hamilton Brass Mig. 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, Out.

#### Lathes

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

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 & McCullook 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. Hydo Park, Mass. Darling Bros., Montreal Petrie, H. W., Toronto.

#### Malleable Castings

McKinnon Dash & Metal Works Co., St. Catharines, Nozzies
Ont.
Smith's Falls Malleable Castings Co., Smith's Falls, McCullough-Dalzell Crucible Co., Pittsburg, Pa. Ont

#### Marine and Stationary Engines and Boilers

Allis-Chalmers-Bullock, Limited, Montreal. Jenekes 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. Pediar People, Oshawa, Ont

#### Metal Stamping

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

#### Metallurgists

Mills, S. D., Toronto

#### Mill Machinery and Supplies

Allis-Chalmers-Bullook, 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.
Gutts Percha & Rubber Mig. Co., Toronto.
Hamilton Brass Mig. Co., Hamilton, Ont.
Hamilton, Wm., Mig. Co., Peterborough, Ont.
Hamilton, Wm., Mig. Co., Peterborough, Ont.
Hay, Peter Knife Co., Galt, Ont.
Hopkins, F. H. & Co., Montreal.
Joffrey Mig. Co., Columbus, Ohio.
Jenckes Machine Co., Sherbrooke, Que.
Morrow, John. Machine Serew Co., Ingersoll, Ont.
McDougall, John. Caledonian Iron Works Co., Montreal.
McLaron, D. K., Montreal and Toronto.
Petrie, H. W., Toronto.
Robb Eng'-cering Co., Amherst, N.S.
Smart-Tunner Machine Co., Hamilton, Ont.
Spence, R. & Co., Hamilton, Ont.

#### Milling Cutters and Machines

Rocker-Brainard Milling Machine Co., Hyde Park,

#### Miners' Lamps

Allis-Chalmers-Bullock, Limited, Montreal.

#### Mining Machinery

Allis-Chalmers-Bullock, Limited, Montreal, Canadian Rand Drill Co., Sherbrooke, Qua. Gartshore, John J., Toronto.
Hamilton, Wm. Mig. Co., Peterborough, Ont.
Hopkins, F. H. & Co., Montreal,
Jeffrey Mig. Co., Columbus, Ohio,
Jenckes Machine Co., Sherbrooke, Que.
McDougall, John, Caledonian Iron Works Co., Montreal

real.
Perrin, William R. & Co., Limited, Toronto.
Petrie, H. W., Toronto.
Williams, A. R. Machinery Co., Toronto.

#### Motors and Dynamos

Allis-Chalmers-Bullock, Ilmitod, Montreal, Canadian General Electric Co., Toronto. Canadian Westinghouse Co., Ltd., Hamilton, Ont. Electrical Construction Co., London, Ont. Forman, John, Montreal.

Jeffrey Mig. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Keystone Engineering Co., Toronto.
Petric, H. W., Toronto.
Sturtovant, 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.

#### 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 Cleth Co., Montreal.

#### Paints and Colors

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

#### Paper Manufacturers

Barber, Wm. & Bros., Georgetown, Ont. Toronto Paper Mig. 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, Chio Greening. B. Wire Co., Hamilton, Ont. Metallic Rooling Co., Toronto. Pedlar People, Oshawa, Ont.

#### Personal Accident

Canadian Casualty & Boiler Insurance Co., Terente

#### Phosphorizors

McCullough-Dalzell Crucible Co., Pittsburg. Pa.

Plano Action and Key Machinery Gearing, H., Toronto.

#### Pig Iron

Bourne-Fuller Co., Cloveland, Ohio. Canada Iron Furnaco Co., Montreal. Nova Scotia Steel & Coal Co., New Glasgow, NS. Syracuso Smelting Works Montreal.

Pipe (Riveted, Iron and Ste: 1) Babcock & Wilcox, Limited, Montreal, McDougall, John, Caledonian Iron Works Co., Mcctreal.

Pipe Threading Machines

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

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

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

#### Pneumatic Tools

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

Pointer Bulls (For Rods and Wire) Turner, Vaughn & Taylor Co., Cuyahoga Falls, Okio

#### Power Plants-Equipments

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.
Eleotrical Construction Co., London, Ont.
Goldio & McCulloch, Galt. Ont.
Gutta Percha & Rubber Mfg. Co., Toronto.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Joffrey Mfg. Co., Columbus, Ohio.
Jones & Moore Electric Co., Toronto.
Keystone Engineering Co., Toronto.
McDougall, John, Caledonian Iron Worls Co., Rest

McDougall, John, Caledonian from Worl's Co., Rereal.

Packard Electric Co., St. Catharines, Ont.
Perrin, Wm. R. & Co., Limited, TorontoPhillips, Eugens F., Electrical Works, Montrel
Robb Engineering Co., Amherst, N.S.
Smart-Turner Machine Co., Hamilton, Ont.
Sturtevant, B. F. Co., Boston, Mass.
Toronto & Hamilton Electric Co., Hamilton, Ott

#### Presses (Tile, Sewer Pipe, Nozzles and Sleeves)

Turner, Vaughn & Taylor Co., Cuyahora Falls, @ Ma.

#### Pulleys

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

#### Producer Gas Plants

Economic Power, Light & Heat Supply Co., Torreta

#### Pumps and Pumping Machinery

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

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Darling Bros., Montreal.
Downie Pump Co., Downieville, Pa.,
Goldie & McCullooh Co., Galt, Ont.
Jenekes Machine Co., Sherbrooke, Que.
Kerr Engine Co., Walkerville, Ont.
Morris Machine Works, Baldwinsville, N.Y.
McDougall, John, Caledonian Iron Works Co. Montreal.

real.
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.

Puriflers

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 L.o. 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.

Book 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

Safes and Vaults Goldie & McCulloch Co., Gait, 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-Bullook, Limited, Montreal.
Bourne-Fuller Co., Cleveland, Ohio.
Goldie & McCullooh Co., Galt, Ont.
Jeffrey Mfg. Co., Columbus, Ohio.
McDougall, John, Caledonian Iron Works Co., Montreal.
Nove Sec Shafting real. 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 Mont-real.

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

Sheet Metal Goods

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

Sheet Metal Stamping

Globe Machine & Stamping Co., Cleveland, Ohio. Metallic Roofing Co., Toronto. Pediar 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., Mont-

real.
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, Lim.ted, Montreal.

Steam Specialties

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

Steam Valves

Babcock & Wilcox, Limited, Montreal. Dancing Bros., Montreal.

Merr 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 & McCullooh Co., Galt, Ont.
Hamilton, Wm. Mfg. Co., Peterborough, Ont.
Lealie, A. C. & Co., Montreal.
McDougall, John, Caledonian Iron Works Co., Montreal.
Nova Scottic State of Co. 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-Dalsell Crusible 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.
Jenekes 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.

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.

Lealie, 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., Mont-real. 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. Jenekes Machine Co., Sherbrooke, Que.

Valves

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.
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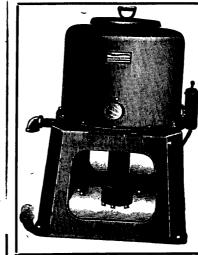
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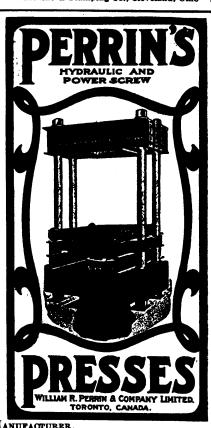
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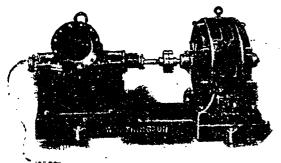


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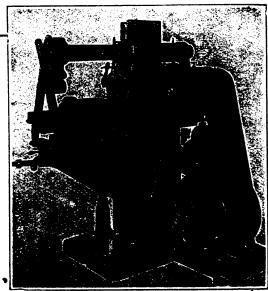
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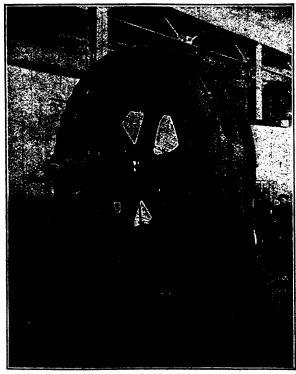
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per Emil C. Boeckh, Pres't & Gen'l Manager.

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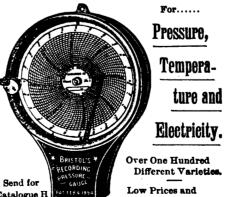
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