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1920

POWELL WOOD PROCESS

[illegible] of authority [illegible] that he has power to [illegible] and states that he [illegible] authority [illegible]. States [illegible] with Sir [illegible]

[illegible]

[illegible] back by [illegible]

[illegible] B.E.A.

27.11.20

Thursday at [illegible]

at once.

H. J. R. 29/11/20

All Communications to be addressed to the Firm and not to individuals

THE POWELL WOOD-PROCESS SYNDICATE, LIMITED.

Telegraphic Address: Powellized, Ave, London

[illegible]

Telephone No 10012 Central

[illegible] Salisbury House, London Wall, London [illegible]

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Replying to yours

In reply please quote J.801 10th October 1919

C. H. PRITCHARD Esq.,
3, Fairview Road,
Banbury, Oxon.

Dear Sir,

We authorise you to negotiate on our behalf with the Colonial Office, the Crown Agents for the Colonies and/or the Government of the British East African Protectorate respecting the adoption of our Process for the treatment of timber in British East Africa under the Patent Rights held by the Syndicate.

Any Contract signed by you on our behalf under this Authority will be as [illegible] as if it had been signed by us.

[illegible] liberty to communicate the [illegible] these matters [illegible] His Majesty's Government.

Yours faithfully,

For THE POWELL WOOD-PROCESS SYNDICATE LTD.

[signature] Director.

[signature] Secretary.

14th January, 1921

Dear [illegible]

I am sorry that owing to pressure of work I [illegible] a reply to without answering your letter of [illegible]. I am afraid that I have no note of what passed [illegible] but rather than not attempt to arrange [illegible] however, now find for both Brooke, the Chief [illegible] Minister of Labuan, and although I discussed the [illegible] with Major Rhodes, their Governor, before he left [illegible] November, it did not occur to me that I had [illegible] to put you in touch with him; in fact, your [illegible] to me as a surprise.

I am writing to him about the Powell Cranmore [illegible] to-day's m[illegible]. But I do not think that it is possible in any way t[illegible] it on the local authorities. For one thing, [illegible] come into with them [illegible] put [illegible] the Secretary of State by [illegible]. For another, [illegible] Branch is to be con-[illegible] and trial available on the relaying [illegible]

Yours [illegible]

of the main Uganda Railway with [illegible] Timber, and I do not think that the General [illegible] would be prepared to adopt for the relaying a process the usefulness of which has not yet been proved with East African timber.

Yours faithfully

[illegible]

AUSTRALIA. TRANS CONTINENTAL RAILWAY.

NOTE RE SLEEPERS LAID.

[illegible]	[illegible]	[illegible] Bark	Powellised Karri.
Laid [illegible] 1914-13	[illegible]	100,000	454,000
Renewals prior to July [illegible]	[illegible]	8,150	[illegible]
Renewals for year to [illegible]	[illegible]	[illegible]	[illegible]
Total Renewals to July 19[illegible]	[illegible]	[illegible]	[illegible]68

* The above figures are [illegible] Commonwealth Railway Commissioner's report for [illegible] 1922.

During the first few years [illegible] will be [illegible] out for renewals some sleepers which should never have [illegible] been rejected on inspection [illegible] measure [illegible] comparison of the sleepers [illegible] have been [illegible] This may be [illegible] the [illegible] ending 30th June [illegible] that [illegible] Reducing the record [illegible] 454,000 gives :-

The comparative renewa[illegible]

showing the superiori[illegible] Powellised sleepers [illegible]

Memorandum B 1119.
Dated Oct. 2nd. 1922.

Notes extracted from the Indian Forest Economist's Report on Tests of Powellized Sleepers.

[illegible]

Test of 812 Powellized Broad Gauge Sleepers of CHIR (Pinus Longifolia).

[illegible] 3/13 to 4/1 marked P.L.C.
[illegible]-Lhaksar section, Oudh and Rohilkhand Railway.

[illegible] to 1/4½ marked [illegible]
[illegible]-Lucknow [illegible] Oudh and Rohilkhand Railway.

[illegible] to 251/77 [illegible]
[illegible] section, [illegible] Railway.

[illegible] to 206 [illegible]
[illegible] section, [illegible] Railway [illegible]

[illegible]
[illegible] section, Bengal Nagpur [illegible] Railway.

[illegible] between December [illegible] April 1912.

[illegible] Report by the Forest Economist published in 1918 states these sleepers [illegible] been in the line from [illegible] years [illegible] have been removed during that [illegible] years. The only report [illegible] sleepers comes from those [illegible] the Ranaghat section, Eastern Bengal State Railway, where one sleeper [illegible] found to be severely and [illegible] damaged. No dry or wet rot has as yet [illegible] far as the process is concerned the results are very satisfactory, [illegible] into consideration that this timber barely lasts two years when laid in [illegible] untreated state. This shows that the life of over 99 per cent. of [illegible] sleepers was increased [illegible]

[illegible] further [illegible] July 1922 [illegible] after 9 years (or 4½ times [illegible] the [illegible] sleepers, [illegible] these sleepers were still serving [illegible] per cent. [illegible] rejected. The Report [illegible] would be noted that [illegible] selected [illegible] otherwise, the results [illegible] now the case [illegible] of the time they were [illegible] results could be obtained [illegible]

[illegible] Report [illegible] Cawnpore [illegible] the Oudh and Rohilkhand [illegible] per cent. [illegible]

Notes extracted from the Indian Forest Economist's Reports on Tests of Powellized Sleepers.

139

Test of 677 Powellized Broad Gauge Sleepers of KAIL (Pinus Excelsa).

108 laid mile 4/1 to 4/2 marked [illegible]
Hardwar-[illegible] section, Oudh and Rohilkhund Railway.

108 laid mile 1/4½ to 1/[illegible] marked [illegible]
Cawnpore-Lucknow [illegible] Oudh and Rohilkhund [illegible]

[illegible] laid mile 281/12 to [illegible] marked [illegible]
[illegible]-Karachi section, North-Western [illegible]

[illegible] laid mile 2[illegible]/15 to 2[illegible]/16 marked [illegible]
[illegible] Quetta section, North-Western Railway.

246 laid mile [illegible]/4 to [illegible]/10 marked [illegible]
[illegible] Station, Eastern Bengal State Railway.

677 laid from December 1911 to April 1912.

A Report by the Forest Economist published in 1918 states these sleepers have been in the line from 5 to 6 years and two have been removed during that period. There are no reports of [illegible] having attacked the sleepers. The results to date of Powellized sleepers are quite good. [illegible] treated [illegible] sleepers [illegible]

[illegible] Report of July [illegible] years and 1 month [illegible] the above sleepers [illegible] showing that [illegible] per [illegible] in the line. The Report states it should [illegible] very selected before treatment, otherwise [illegible] than is now the case. Then again, at the time they were laid it was not known that in the case of Pines infinitely better results could be obtained by laying treated sleepers [illegible] sap down.

[illegible] sleepers laid on the Cawnpore-Lucknow branch [illegible] March [illegible] shows [illegible] years [illegible] sleepers, [illegible] per cent [illegible]

Memorandum B 1119.
Dated Oct. 2nd, 1922.

Notes extracted from the Indian Forest Economist's Reports on Tests of Powellised Sleepers.

187

Test of 815 Powellized Broad Gauge Sleepers of SAIN (Terminalia Tomentosa).

131 laid mile 3/16 to 3/17 marked P.I. T.
[illegible] section, Oudh and [illegible]

187 laid mile 7/6 to 7/4 marked T T
[illegible] branch Oudh and Rohilkhand [illegible]

168 laid mile [illegible] 26 [illegible]
Sul[illegible]

316 laid m[illegible]
Sib[illegible]

122 laid [illegible]
[illegible]

101 laid [illegible] 46/11 to 46/12.
North of [illegible]

815 laid from [illegible] to September [illegible] in four cases, and in June 1913 [illegible] cases.
North of [illegible]

A Report by the Forest Economist [illegible] 1918 states these sleepers have been in the line **nearly 6 years**, [illegible] during that period [illegible] practically 99 per cent [illegible] in the line.

The removals have been due in every case to original faults. It is known that these sleepers were [illegible] old trees, and [illegible] after logging, hence many of the sleepers [illegible] faults. As a matter of [illegible] is probably the best of the five species tested for sleepers, as the [illegible] extremely hard and, though liable to [illegible] greater than that of "Pyinkado" (Xylia [illegible]) which is [illegible] the best sleeper woods in [illegible]. The spikes [illegible], the [illegible] under the rail-seat is insignificant and [illegible]. The [illegible] to date with this species [illegible] very satisfactory.

A further Report [illegible] **after [illegible] years and 1 month 95 per cent.** of these sleepers were still serving their purpose [illegible]. The Report states it should be [illegible] the sleepers [illegible] selected before treatment, otherwise the results might have been [illegible] the case. Then again [illegible] of [illegible] better results could be obtained [illegible] heart up and sap down.

A further Report of July 1922 indicates that **after 9 years and [illegible] months 95 per cent.** of these sleepers were still serving their purpose in the line.

A further Report of the 187 sleepers laid on the [illegible] Branch of the O. & R. Railway, on inspection in March 1922 shows that **after 10½ years 99 per cent.** were still serviceable in the line.

Memorandum B 115
Dated Oct. 2nd. 1922.

Notes extracted from the Indian Forest Economist's Reports on Tests of Powellised Sleepers.

133

Test of Powellised Broad Gauge Sleepers of In (Dipterocarpus Tuberculatus).

Laid ... platform mile 2 ... Eastern Bengal ...

A Report by the Forest ... sleepers were laid down nearly 6 years ... Their condition has changed ... cracks have developed; the ... under the rail-seat is, in some cases, ... deep. These Powellised "In" sleepers may be said to be doing very well ... taking into consideration that the life of untreated "In" sleepers ... years.

A further Report ... indicates that after a period of 9 years and 5 months 91 per cent ... serviceable in the line.

Test of Powellised Broad Gauge Sleepers of K... YIN (Dipterocarpus Alatus).

Laid ... mile 22 ... Eastern Bengal ...

A Report by the Forest ... published ... sleepers ... removed ... years they have been ... line. Their ... "In" sleepers, with which ... the tendency to split in these sleepers is somewhat more ... marked than in the case of "In". The spikes are holding well, while the ... under the rail-seat ... as it ... in the case of "In" sleepers, the necessity of ... bearing plates ... results to date of Powellised "Kanyin" sleepers is ... satisfactory.

... further Report ... 1921 ... 5 months ... per cent. ... still serviceable ... should be noted that the sleepers were ... before treatment, otherwise the results ... now the case. Then again at the time ... in the case of Pines ... infinitely better ... treated sleepers heart up and sap down.

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THE POWELL WOOD-PROCESS SYNDICATE, LTD.
715, SALISBURY HOUSE,
LONDON, E.C.2

Notes on Seasoned Timber

Memo B.

Timber consists of fibre, hole and water. The greater the proportion of the [illegible] water in the wood, the lighter is the wood.

Powell's [illegible] the holes [illegible] wood after treatment as [illegible] the fibre.

In air-dried timber the water is slowly evaporated and the [illegible] of the fibre; the air spaces become [illegible] quantity of wood substance in the fibre is not increased.

In kiln-dried timber the fibres are desiccated, the holes made larger and the wood [illegible].

In neither case will the wood, if exposed to air varying in moisture, for [illegible] will expand and contract in dr[illegible].

Powell [illegible] untreated [illegible].

[illegible]

[illegible] for vacuum is required to effect the absorption [illegible] timber generally is so greedy of soluble carbo-hydrate that it will take up, if permitted, far more than it can assimilate and convert into ligneous fibre; it is one of the arts, therefore, of Processing to stop absorption at the right stage.

The second law accounts for the stability of Powellized wood, as in the Process it is [illegible] to [illegible] pressure which fixes [illegible] it from liability to contract or expand [illegible] under [illegible] changes of temperature or moisture.

Messrs. [illegible] of [illegible] Wycombe [illegible] since [illegible] furniture made of Powellized wood in their [illegible] single instance reported to them of the [illegible] worse American conditions, when [illegible] made in this country from [illegible] years old failed [illegible]

[illegible] and strengthened it becomes [illegible] where there is [illegible] even wood [illegible]

[illegible] of the large [illegible] of High Wycombe [illegible] on old centre [illegible] same time, a [illegible] and balusters was fixed in [illegible] raised dais. The [illegible] supplied and Powellized by Messrs. [illegible] the request of the [illegible]. The joints of the woodwork are imperceptible to the touch and the [illegible] is a perfect match to the centre portion, [illegible] is of great age.

As the sap, including the albuminous and other nitrogenous substances are extracted during the process and replaced with carbo-hydrates, the weight of the [illegible] wood is in general little, if any, more than air-dried timber.

Powellized wood is absolutely and equally seasoned from the outside [illegible] which is not always the case with ordinary [illegible] of three or four [illegible] thickness. It is a common thing for [illegible] mahogany planks [illegible] Powellized and after [illegible] into smaller [illegible] sleepers five inches [illegible] Powellized in large [illegible] effective throughout [illegible] the cure.

[illegible] kiln drying [illegible] no harmful effect [illegible] aqueous [illegible] and [illegible] been taken [illegible] dried in a [illegible] drying [illegible] it need [illegible] is essential.

[illegible] open air [illegible] about one-tenth [illegible] it [illegible] years.

[illegible]

LONDON, E.C.2

[illegible] on the [illegible] of Timber.

[illegible] A

When [illegible] is felled it does not [illegible] immediately, [illegible] is [illegible] [illegible] shoots and [illegible], thereby showing [illegible] endosmotic property of the timber [illegible] through the cells and the absorption through the [illegible] does not cease for a long time. This is an important fact to bear in mind. The tree, though it ceases to [illegible] in bulk, still feeds on the carbo-hydrates in the sap, and the fibres increase in strength so long as endosmosis lasts. This is why air drying is so much superior to kiln drying.

[illegible] drying, however, is a very slow process, and for many purposes [illegible] supplemented by [illegible] subjecting the wood for some time to moderately [illegible] air in workshops, etc., before being used, especially for cabinet work, coach-building, etc. For these special purposes wood is sometimes [illegible] air drying from fourteen to twenty years and even then does not attain the necessary dryness.

Now we come to the question what quantity of moisture should thoroughly seasoned timber contain? Generally speaking, commercially "seasoned" wood contains about twelve per cent. of moisture, "bone-dry" wood, used for cabinet and similar work, about eight per cent.; and "tinder-dry" wood about five per cent. It is difficult and costly to attain these lower figures by air drying, as a great length of [illegible] care are required, for, as the moisture decreases the slower is the [illegible] drying. This, however, is true seasoning, as opposed to merely drying [illegible] the wood fibres absorb most of the carbo-hydrates from the sap, while the aqueous matter is evaporated slowly it is true, but without injury to the [illegible].

Kiln drying [illegible] a rapid method of drying timber and making it ready for use [illegible], but kiln drying immediately stops the endosmose [illegible] evaporating the water of the sap, leaves the fibres of the timber with the carbo-hydrates of the sap unabsorbed as food for the first attack of [illegible]. Kiln drying is not "seasoning" timber, it is merely drying it. An [illegible] timber that has ceased to feed on the sap is not injured [illegible] final course of kiln drying, as then only the superfluous moisture remains to be evaporated.

Powellizing is a simple method of first strengthening the fibres of the timber to their maximum extent by supplying them with very strong sap or like solution in place of the [illegible] natural sap remaining in the timber when it is felled; indeed, [illegible] to be exercised to prevent the wood absorbing [illegible] rich sap.

By presenting, under favourable conditions, concentrated sap, very much stronger than the natural sap, the fibres take in in a few hours the maximum amount of carbo-hydrates they can. When the wood has once been charged up to its limit of assimilation there is then only the excess moisture to be evaporated, and this may be done in a drying kiln without injury to the timber [illegible] the open-air.

The amount of moisture perfectly seasoned timber should contain depends upon the nature of the wood and the purpose for which it is required.

For instance, mahogany, beech, birch, walnut, etc., for cabinet work, where stability rather than strength is concerned, should be quite dry, containing less than eight per cent. of moisture, especially if the furniture is to be exported [illegible] dry climates such as Egypt or India. Timber such as ash, oak, elm, [illegible], etc., whose strength, elasticity and [illegible] are required at their maximum [illegible] a lower percentage [illegible].

[illegible] woods. Mahogany, for instance, [illegible] Honduras to [illegible] African, [illegible] for [illegible].

[illegible] commercially valuable [illegible].

B 657

THE POWELL WOOD-PROCESS SYNDICATE, LTD.
710, Salisbury House, London Wall, E.C.

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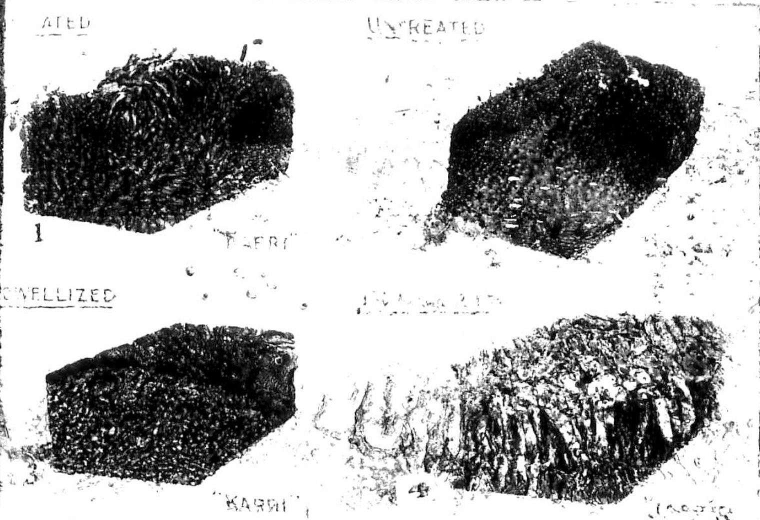
Note on Tests of Powellized and Untreated Karri and Jarrah in THE WESTRALIA COAL MINE AT WEST COLLIE.

Sample pieces 4 in. × 3 in., about 4 ft. long

Powellized at the West Australian Government Powellizing Works



March 30th. Sample pieces placed in [illegible]

20th. No change having appeared [illegible] Fungus [illegible] growing [illegible]

[illegible] About [illegible] years after being [illegible] thick paper-like growth of [illegible] depth of 1in. [illegible] white thread [illegible] of wood. Wood rotted [illegible] POWELLIZED [illegible] knife test showed few patches [illegible] growth visible. Knife tests [illegible] first placed in [illegible] on 30th March [illegible]

Sept 21st. Sections cut off each piece [illegible]

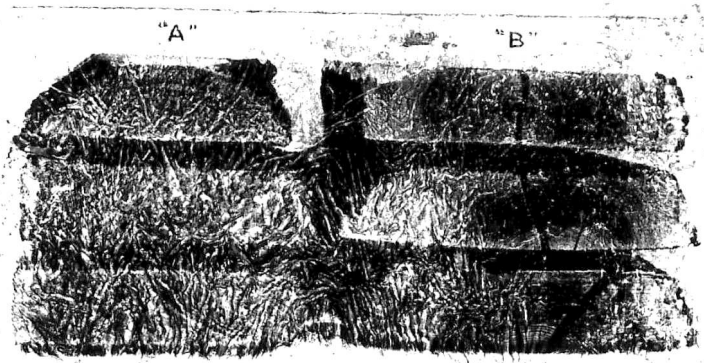
Sept 29th. Sections hurriedly photographed [illegible] the affected specimens showed signs of [illegible]

Oct 11th. Sections shown in photos were submitted [illegible] Pathologist (Mr. D. [illegible]) for microscopical examination [illegible] found that the outer wood of the untreated specimens which had previously yielded to the pen knife tests was undoubtedly damaged by the fungus but that the hard inner wood was still unaffected. He also found that fungus had not penetrated the Powellized [illegible] and added, "Fungi present on both Powellized specimens but are only saprophytes growing on superficial dirt, the principal species found was Rhizopus nigricans."

Dec. 6th, i.e. 4½ years after being placed in the mine the remaining portions of the samples show, UNTREATED Karri & Jarrah covered with thick coating of fungus with fibrous roots coming from the ground. POWELLIZED Karri has small patches like salt on it. No growth whatever. Jarrah ro[illegible]

THE POWELL WOOD PROCESS LTD. ETC.
715 Salisbury House, London Wall, E.C.2.

Illustration of Powellized and Untreated Ash.



ASH TREE. FELLED AND SAWN INTO 3" PLANKS ON THE SAME DAY

"A"_POWELLIZED THE DAY AFTER FELLING

"B"_UNTREATED

The above photograph shows the effect of the Powell Wood Process as a preventative of checking and splitting in seasoning. Incidentally the process kills all fungus spores in the wood, sterilizes and strengthens it.

The [illegible] illustrated is English Ash and the planks are 3" thick.

A tree about 14ins diameter and 40ft long was felled for a demonstration of rapid seasoning.

On the same day that the tree was felled it was sawn into planks, as and which were seasoned by Powellizing on the following day, while other planks were retained for air drying and untreated.

The Powellized planks were passed direct from the [illegible] to a drying kiln and reduced dry in 28 days, whilst as shown in the above photograph, there was no cracks or flaw in them. The untreated wood stored under cover at even temperature [illegible] and split and shaken badly.

Examination of the wood by an expert disclosed the fact that the tree was of good quality with evidence of blackheart.

The condition of the treated planks demonstrates the reinforcement of the wood by Powellizing and the great value of the Process in dealing with timbers having a tendency to split and shake in seasoning. The result was looked upon as extraordinary, but similar results are well known to us with other timbers. The tendency to split and shake in seasoning is invariably reduced by Powellizing and in some cases prevented while it often happens that small shakes are closed up during processing.