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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

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*Proceedings of the Madras Government, Public Works Department,
19th June 1869.*

No. 419. Read the following Proceedings of the Government of India in the Public Works Department, (Civil Works—Miscellaneous) dated Simla, 17th May 1869, No. 260 C:—

Introduction of Hoffman's Patent Brick-Kilns into India.

Read again the following papers:—

Letter from Secretary to the Government of Bengal, in the Public Works Department, No. 5,171, dated 12th August 1868.

Letter from Secretary to the Government of the North-Western Provinces, in the Public Works Department, No. 4,433, dated 21st August 1868, and enclosure.

Despatch from the Government of India, to the Secretary of State, No. 132, dated 4th September 1868.

Report by Mr. Hickmott, Superintendent of the Akra Brick Factory, dated 5th November 1868.

Despatch from the Secretary of State, to the Government of India, No. 34, dated 24th March 1869.

ORDER.—Ordered, that a copy of paragraphs 1 to 4 and 6 and 7 of the Despatch from the Secretary of State, with the plans and specifications in original, be forwarded to the Government of Bengal for information, with intimation that no steps will be taken in the matter of the brick-making machines, or the engagement of William Wilders, until proposals with reference to them are made by His Honour the Lieutenant-Governor.

Also, that copies of Mr. Hickmott's report, and of the same paragraphs of Despatch from Secretary of State, be forwarded to the Government of the North-Western Provinces for information.

Also, that copies of the same, with the earlier correspondence, be forwarded for information to the Governments of Madras, Bombay, and the Punjab.

(Signed) R. D. PEMBERTON, Captain, R. E.,
Asst. Secy. to the Govt. of India.

To the Secretary to Government of Madras, Public Works Department.

From the Secretary to the Government of Bengal, in the Public Works Department, to the Secretary to the Government of India, in the Public Works Department, dated 12th August 1868, No. 5,171.

I AM directed to submit herewith, for the consideration and orders of the Government of India, the accompanying letter in original, from Mr. Hermann Wedekind, dated London, the 2nd May last, in reference to Hoffman's patent kilns for burning bricks, lime, cement, &c., together with one of the printed pamphlets on the kilns, which were received with the letter.

2. I am to state that the Chief Engineer is disposed to take a favorable view of the invention, and would wish to try it; but since the invention is stated to have been tried in the Government Departments in England, it would be desirable to ascertain the opinion formed of it in those departments, and if this were favorable, the Lieutenant-Governor is of opinion that the necessary plans and instructions should be obtained from the Patentee, and also the iron-work for six kilns.

3. The kilns seem principally suited to large works; and if they come up to the description given, they would suit admirably for Akra, and for the construction of the large central jails. It is with this end in view, as well as to give the kilns, if promising well, a fair trial, that it is proposed to get out several sets of the iron-work.

4. It will be observed from Mr. Wedekind's letter, that the Patentees would prefer to sell their patent outright, but as the patent is not protected in this country, this is obviously out of the question. If the kiln proved successful in this country, it would probably be the best arrangement to agree to pay a royalty on the number of good bricks produced up to a specified number.

5. It is not known what the extent of saving to Government would be: it would be greater than otherwise if wood-fuel could be used and the system extensively employed. Again, the

*Proceedings of the Madras Government, Public Works Department,
19th June 1869.*

varieties in coal, in climate, &c., are very sure to affect the arrangements, and, as in most things, experience will have no doubt to be bought. It seems impossible to hazard any precise opinion as to what it would be worth while to offer; but the Patentees seem to desire to be reasonable, being aware of their want of control over operations in this country, and probably a satisfactory arrangement could be made with them.

6. I am to mention that the out-turn from the Akra Brick Factory during the past year has not been so great as was desired, though larger than in the preceding year; that the demands have been great; and that, at the rate of issue for the last few months, the stock will not last beyond January or February next, by which time, according to usual arrangements, the current year's stock will not be available. The best means of arranging to meet this difficulty is under careful consideration, and every exertion will be made to prevent inconvenience; but if these kilns would do what is stated, and deliver daily a certain quantity of bricks, the relief by introducing them would be great and immediate.

7. Mr. Hickmott, the Superintendent of the Akra Factory, will, it is believed, shortly return to India. In the present state of the Factory, it is most desirable that he should not delay; at the same time, if this new system is to be introduced, it would be of great importance that he should be conversant with it.

8. Both these ends could probably be attained by telegraphing to the Secretary of State; and I am to request that, if there is no objection, this means of communication may be employed. One set of iron-work, or, at any rate, patterns might be sent out overland.

9. The operations of the Akra Factory will form the subject of a report to the Government of India, which is just ready.

From the Secretary to the Government of the North-Western Provinces, in the Public Works Department, to the Secretary to the Government of India, in the Public Works Department, dated 21st August 1868, No. 4,433.

I am directed to address you on the subject of Hoffman's kilns for brick-burning, and their use by this Department.

2. You have probably received copies of a circular by the Firm in England, now in possession of the patent rights in these kilns, copy of which I am, however, to enclose, and are aware that they are, there is little question, an invention of the highest practical utility, more especially in this country where fuel is procured with so much difficulty. As far as can be judged from the testimonials held by the Patentees, and also from the nature of the process adopted, there is every reason to believe that bricks may be burnt in this way with from one-fourth to one-third the quantity of fuel required in kilns of the ordinary kind, with a decrease in price of the bricks, therefore, of more than one-half.

3. Captain Thomason has built a kiln of this kind, guided by a description in one of the professional periodicals, and has burnt some bricks with, it is reported, very fair success, and now Major Peile is anxious to establish such kilns at Meerut.

4. But you will observe that the patent-holders in their circular set up a claim to a royalty for the use of these kilns in this country, and it is not known to this Government whether this claim has any foundation.

5. The patent-holders suggest in their letter (copy enclosed) to my address, as a satisfaction of their claim, a payment down of £100 for each kiln built in this country, and this seems to His Honour the Lieutenant-Governor to be, as they observe, a reasonable proposal. The royalty charge in England is said to be at the lowest 6d. per 1,000 bricks burnt, and, as it would certainly be practicable to turn out during one year from a medium-sized kiln 4,000,000 bricks, such a royalty charge would amount to the sum mentioned, £100, in one year.

6. It may be possible, His Honour thinks, to ascertain from the Home Department of the Government of India whether the patent rights in this invention do extend to India, and if it should be found that they do, or if there should be any doubt about it, I am to suggest the expediency of addressing Her Majesty's Secretary of State, with view to his entering into negotiations with the patent-holders for the right to use the kilns in this country; and I am also to suggest

*Proceedings of the Madras Government, Public Works Department,
19th June 1869.*

that it might probably be of much use if a man were sent out by the Secretary of State, who thoroughly understands the use of these kilns, if such a man can be engaged for a salary of £300 per annum, or thereabouts, more especially as kilns of a temporary kind are mentioned in Mr. Wedekind's letter, which would probably be of great service to this department, and I am to add, if this person were skilled in the manufacture of pottery, it would be an advantage. Mr. Beale, who was sent out three or four years ago to improve our tile manufacture, though a good brick and tile-burner, is not, I am to remark, possessed of any chemical knowledge which might be of use in improving our pottery.

7. I am to intimate that directions are now being given to Major Peile to build the kilns he proposes at Meerut, as it is most desirable not to lose the advantage of this invention for another working season.

8. I am to add that a report by Captain Thomason on his experiment will shortly be printed and furnished to you.

From HERMANN WEDERKIND, Esq., London, to the Chief Engineer to the Government of the North-Western Provinces, dated 2nd May 1868.

CAPTAIN TULLOCK, R. E., called on me lately in reference to Hoffman's Patent Ring Oven for burning bricks, lime, &c., on the continuous principle. This patent construction has found great favour amongst Engineers and Contractors in this country, and also the Government have built four large-sized kilns near Portsmouth. India being such an important country for the extensive use of these kilns, Captain Tullock advised me to send you a number of pamphlets illustrating and explaining the same and its merits. The advantages are great—saving in fuel (two-thirds to three-fourths,) smokeless combustion, labour in burning considerably less, and no loss in irregular burning, as the heat can be easily directed to any part of the kiln. Any fuel available can be used with advantage, while, of course, here we burn with small dust coal as being the cheapest fuel. The kilns can be built any size, burning from 5,000 to 40,000 bricks per day. For temporary purposes, we merely build the burning chamber, and work the kiln by means of a moveable fan driven by machinery, while for stationary work, kilns are built as illustrated with a chimney in the centre to carry off the steam and waste gases of a temperature fresh enough to create and support a draught. Patent charges in England are £32 for plans, and 6d. to 9d. royalty per 1,000 bricks according to the cost of fuel. But having no control over the kilns if built in India, we thought the payment of £100 for each kiln built would be considered a very reasonable charge, although we should much prefer selling the patent out-right. I should feel much obliged if you will favour this subject with your attention, and kindly distribute the spare copies sent amongst the Public Works. I should be happy to give all necessary information, working drawings, and specification, enabling you to construct and work the kilns without further assistance. The iron-work required, consisting of a number of feed-pipes and caps, and valves of cast-iron, and two intersecting dampers of sheet-iron, can be supplied at a cheap rate, if size of kiln to be built is given in ordering plans.

Trusting that I have the pleasure of an early communication on the subject.
From the Government of India, to the Secretary of State for India, dated 4th September 1868, No. 132.

We have recently been addressed by the Lieutenant-Governors of Bengal and the North-Western Provinces on the subject of the adoption in this country of Hoffman's patent kilns.

2. Mr. Wedekind, the Agent of the Patentees, states that in England their patent charges are £32 for plans, and 6d. to 9d. royalty per 1,000 bricks according to the cost of fuel. As the Patentees would have no control over kilns built in India, Mr. Wedekind considers that a payment of £100 for each kiln would be a reasonable charge, but he would prefer to sell the patent out-right for this country. It is said by the Agent that the Patentees can supply the iron-work at a cheap rate on being furnished with information as to the size of the kiln and of the bricks to be burnt.

3. The demands on the Akra Government Factory, near Calcutta, are reported to be greater than it can meet, and that, with the present rate of issue, the stock in hand will probably not last

beyond January or February next. The Lieutenant-Governor of Bengal, therefore, suggests that the opinion which the Government Departments which have tried the kilns in England have formed of their usefulness, may be ascertained, and, if favorable, that the necessary plans and instructions, with the iron-work for six kilns, may be obtained from the Patentees, and arrangements made with them as to the royalty to be paid.

4. The Lieutenant-Governor of the North-Western Provinces reports that a kiln on this plan was built by Captain Thomason from a description in some professional paper, and that some bricks have been burnt in it with very fair success. It is desired to establish such kilns at Meerut, but nothing is known as to the rights of the Patentees in this country, and His Honour recommends that a reference be made to you on the subject, and that, if necessary, negotiations be entered into with the Patentees for the right to use the kilns in India. The Lieutenant-Governor also suggests that a man who thoroughly understands the use of these kilns, and more especially that of the temporary kilns* to which Mr. Wedekind refers in a letter addressed by him to the Chief Engineer of the North-Western Provinces, should be sent out to this country, if the services of such a man can be secured for about £300 a year. It is added that the man should be skilled in the manufacture of pottery.

* The burning chamber alone built, and the kiln worked by means of a moveable fan driven by machinery.

5. We have no reason to doubt that these kilns, if properly worked, will be an improvement on those now in use, and we, therefore, consider it advisable that steps should be taken to ascertain the rights of the Patentees, and, should they possess such rights, the terms on which they will allow the use of the kilns in this country; and also to ascertain the opinion formed of these kilns by the Government Departments who may have tried them, as suggested by the North-Western Provinces Government. In a telegraphic message sent to you on 3rd September, it was requested that Mr. Hickmott, the Superintendent of the Akra Factory, who is now in England, should be detained for a short time to acquaint himself with the working of the kilns. He is a practical man, and has had experience of brick-burning both at the Soane, where he made bricks for the East Indian Railway bridge over that river, and in Calcutta; and we would advise that any immediate action in the matter be dependent on the opinion he may form of the advantages of these kilns.

6. We may add that, should the result of the enquiries made be favorable, it seems to us desirable that the suggestions made by the Governments of Bengal and the North-Western Provinces should be acted upon, and it would be particularly useful if Mr. Hickmott, or the Foreman referred to in paragraph 4, could see any specimens of such kilns adapted for wood-fuel.

Report on Hoffman's Annular Ovens by Mr. E. Hickmott, dated 5th November 1869.

AFTER a careful inspection of these kilns, spread over a considerable time, and a large number of them, I am bound to state my unqualified opinion that they are superior to any thing with which I am acquainted.

It is one of the most simple, yet efficient, means of burning bricks possible.

There can be no doubt of the suitability of these kilns for India; in fact their introduction into that country is more necessary, and would confer a greater benefit than in this.

The small amount of fuel used, with the absolute command of the fire, renders them the surest (for the production of a first-class material) as well as cheapest kilns known either in ancient or modern times.

Economy, valuable as it is, is not the only advantage it affords, it enables brick masters to burn bricks, tiles, &c., all the year round, without the least risk of having the goods destroyed by rain. A little more fuel is required in wet than in dry weather.

In Lower Bengal, where coals for brick-burning purposes are 10d. per cwt., these annular ovens would effect a saving of fuel to the amount of 2s. per 1,000, besides the priceless advantage of affording complete protection to the goods while in process of burning.

This latter security cannot be too highly prized.

Take for example Akra;—we have had a fine brick-making season, and made a large number of bricks (one year 50 millions), but, owing to our system of clamp-burning (which was the cheapest then known), the latter bricks when set in clamps were exposed to the rains for a period of six weeks,—the time under favorable weather it takes the clamp to burn.

If, during this period, heavy rains fall, the bricks are much injured, and sometimes totally destroyed.

These kilns are equally suitable for the North-West and the Punjab Provinces, as wood, peat, or the bazaar refuse could be burnt with perfect success.

The short time it takes to burn building materials in these kilns is of great importance where bricks or tiles are required for emergent works.

The ease and safety with which light tiles (such as are used in India for roofing) can be set and burnt, is of considerable value.

The cost of constructing these kilns, though large, is by no means so large as the cost of ordinary flame-kilns now in use in India and this country.

The ordinary kilns do not possess the advantage of continuity, or as a workman, I should say running kilns, that is, they can be worked for months or years without being put out.

The repairs are not so great as with ordinary kilns.

I have seen some which have been working for five years, built of ordinary bricks, and still in good order, and likely to last for years to come, doing their work satisfactorily.

At Furstinwald the bricks are burnt at a cost of 7d. per 1,000 (size of bricks, 125 cubic inches, being 14 inches larger than London stocks) from coal-dust, which, before the construction of Hoffman's kiln, was thrown in heaps and quite useless. Here women fired this kiln.

This was a large 14-roomed kiln, and is kept in operation all the year round. Two small 12-roomed kilns I saw at Glendon: these were fired with peat, and at both places excellent bricks were produced.

A kiln of this kind, having fourteen rooms and holding in each room 25,000, would burn 750,000 bricks per month. This would give the large number (supposing we fired eight months only) of six millions per one kiln.

With our present flame-kiln at Akra, we could burn in the same time only 1,200,000.

Moreover, there is really no comparison in the uniformity of burning between the flame-kiln and the oven; in fact, the advantages are rather under than over-stated in the pamphlet published by Mr. Frederick Hoffman.

This kiln could be fixed permanently near the River Hooghly, ready for boating the bricks to Calcutta. The earth could be brought on a tramway of two feet gauge at quite as small a cost as that for which we are now paying for digging.

This would give peculiar facilities, as the earth near the river is now used up to the distance of between 400 and 500 feet.

Without this improvement, additional cost must soon (if not already) be incurred in carrying the bricks to the boats.

At times when large orders are given for bricks to be manufactured, it is difficult to procure laborers to make the required number in the short space of five months, the time our season lasts.

With the adoption of the above recommendation, we could continue our manufacture for at least eight months: this would allow us to dispense with about three-fourths of the number of hands at present required.

At Glendon, near Berlin, from one point of view, I counted ten ovens, and the total number round that city is 400.

Mr. Hoffman informed me that one year ago none of his ovens had been introduced into Italy, but since that time sixty have been constructed.

*Proceedings of the Madras Government, Public Works Department,
19th June 1869.*

I am also informed that plans have been sent out for one of these kilns to the Madras Government.

I had an opportunity of looking over Mr. H. Drachis' extensive brick-field near Vienna, and of inspecting one or two of the kilns in question in particular on my voyage Home in May 1867.

Nineteen or twenty were at work at this place, from which (with his other fields) he had produced the enormous number of 200 million bricks per year.

They were giving every satisfaction, and the bricks produced both in the kilns and out of them were the best I ever saw.

These ovens, with Hertel and Company's Brick Machines, and Bradly and Craven's Dry Brick Machine, could be adopted with great success at Akra without interfering with the present working plant on that establishment.

These ovens, with one each of the above machines, I strongly recommend for the use of the Akra Brick Factory.

This will enable us to economise space, as I feel quite satisfied four times the number of bricks can be made and burnt on one acre of ground that are now made under our present system.

The brick machines in general in use on the Continent are Hertel and Company's.

The machines used in Yorkshire at Mr. Craven's are of his own manufacture, named Bradly and Craven's: these are in use at Aylesford.

The oven at Mr. Craven's is of the usual construction, and turns out first-class bricks.

Mr. Craven told me he had more orders than he could supply, and that, had he not the Annular Oven, he should not be able to make and burn bricks at all.

He works machine and kiln in all weathers throughout the year.

The kilns at Cassel are of similar size, and were built from April to June, and since which time bricks have been produced.

Here a class of goods are produced altogether superior to those made and burnt in the usual way.

Mr. Wedekind and Mr. H. Chamberlain told me that negotiations were in progress for the purchase of the patent right by a Firm in India.

Mr. Wedekind informs me that Mr. Hoffman's right as a Patentee is secured for India.

I beg strongly to recommend that William Wilders be sent out to assist me in introducing the new and improved system of manufacture.

He has been driving a locomotive engine for six years, and has paid considerable attention to these ovens, and to making bricks on the table, and, when a lad, used to work with his father at the mould.

He is of sober, steady habits; thoroughly teachable; has good health and energy; his age is twenty-five years.

AKRA BRICK FACTORY,
The 21st January 1869.

Signed) E. HICKMOTT,
Supt., Akra Brick Factory.

(P. S.—If reflection can add anything to the above testimony of this beautiful invention, the simplicity and economy with which it can be worked, I beg to say that the adoption of it for Akra is of greater necessity than ever.

*Proceedings of the Madras Government, Public Works Department,
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I am sorry that my ignorance of the use of my mother tongue has been a great drawback in setting before you in clear and more scientific language the great benefit of this principle of brick-burning)

From the Secretary of State for India, to the Government of India, dated India Office, London, the 24th March 1869, No. 34.

On receipt of your predecessor's Despatch in this Department, No. 132, dated 4th September last, relative to the introduction into India of Hoffman's patent brick kilns, enquiries were made both as to their efficiency and as to the terms on which permission to use the kilns could be obtained from the Patentees.

2. It appears that these kilns have been introduced into Her Majesty's Dock-yard at Portsmouth, and the Admiralty bear strong testimony to their economy, both in fuel to the extent of 50 per cent. over any other system of burning, and from the little loss from bats. The bricks obtained under this system are also superior to any others in their uniform soundness and strength.

3. A report was also obtained from Mr. Hickmott, Superintendent of the Akra Brick Factory, when lately in England, upon these kilns, in which he recommended in the strongest terms their adoption in India.

4. It has accordingly been arranged to supply the necessary iron-work for six kilns, each capable of producing 18,000 bricks per day, and each containing fourteen rooms, which is the arrangement that has been adopted in Portsmouth Dockyard. The iron-work will cost £113 for each kiln in this country. Plans and specifications will also be provided for the sum of £50. The iron-work for three kilns will be despatched to Calcutta in the course of the present month (March), and the remainder five or six weeks later. The plans and the first specification were despatched by the Mail Steamer from Southampton of the 20th instant.

6. In Mr. Hickmott's report, it was suggested that, in the event of the kilns being supplied, certain brick machines should be sent out with them. As the machines are expensive, and could not be required at present, compliance with this suggestion has been deferred, pending receipt of the opinion of your Government upon the subject. Should their provision be considered necessary, an indent should be forwarded for them in the usual manner.

7. With reference to the request in the 4th paragraph of the Despatch under reply, that a man who thoroughly understands the use of these kilns should be sent out, and especially that he should be acquainted with the use of certain temporary kilns there alluded to, I have deferred complying with this request for the following reasons: *firstly*, that the temporary kilns in question are understood to have never been used in practice, and, *secondly*, that Mr. Hickmott appeared to have made himself so thoroughly acquainted with the working of the apparatus that the engagement of a man on a high salary appeared unnecessary. Mr. Hickmott, however, recommended for this employment a young man, William Wilders, who, he stated, had got some knowledge of the kilns, and would be competent to work them under his own superintendence. It will be open to you to make an engage-

*Proceedings of the Madras Government, Public Works Department,
19th June 1869.*

ment with this man, who is understood to be in India, on more favorable terms than could be made with a man in England, should you consider his services necessary.

No. 420.

ORDER THEREON, 19th June 1869, No. 1,996.

CIVIL WORKS, No 67.

COMMUNICATED to the Superintendent Engineer of the 4th Division with reference to G. O., No. 2,617, dated 19th August 1868.

(True Extract.)

Colonel, R. E.,
Secretary to Government.

To the Superintending Engineer, 4th Division.
To R. F. Chisholm, Esq, Executive Engineer.

Exd. S. T. Augustin.

No. 26 C.

GOVERNMENT OF INDIA.
PUBLIC WORKS DEPARTMENT.
CIVIL WORKS
Miscellaneous.

SIMLA, 17TH MAY 1869.

Introduction of Hoffman's Patent Brick-Kilns into India.

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Letter from Secretary to the Government of State, No. 132, dated 4th November 1868.

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Despatch from the Government of India, to the Secretary of State, No. 132, dated 4th September 1868.
Letter from Superintendent of the Akra Brick Factory, dated 5th November 1868.
Letter from Superintendent of the Akra Brick Factory, No. 34, dated 24th November 1868.

Despatch from the Government of India, to the Secretary of State, dated 5th November 1868.

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Despatch from the Secretary of State, to the
March 1869.

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Also, that copies of the same, with the earlier correspondence, be forwarded for information to the Governments of Madras, Bombay, and the Punjab.

R.E.

10000
Captain, R.E.,
Asst. Secy. to the Govt. of India.

To
The Secy to Government
of Madras

*P.W. Dept
No 2260*

GOVERNMENT OF INDIA.
PUBLIC WORKS DEPARTMENT.

CIVIL WORKS.
Miscellaneous.

To

No. 260C.

Dated Simla, 17th May 1869.

Received *29*

E.W. 1

Forwarding papers relating to the question
of the adoption in India of Hoffman's Patent
Kilns.

10th June 1869

with an order

*Transmitted to the Engineering
Division with reference to J. O. No 2647
dated 19th August 1869
for the Dept of Public Works
to be placed in the
files of the
Civil Works
Department
17th May 1869*

17th May 1869

Ce 2260

Gort. of 1869 Madras.

PUBLIC WORKS.

To
The Superintending Engineer
4th Division

Dated

Recd

6. 0 16/June 1869, No. 1996

Nos. 119-120

Hoffman's Patent Brick-kilns

Pos. of the Int. of India relative to the
introduction in India of Hoffman's
Patent Brick-kilns. And the
Supt. Engr. of the 4th Div.