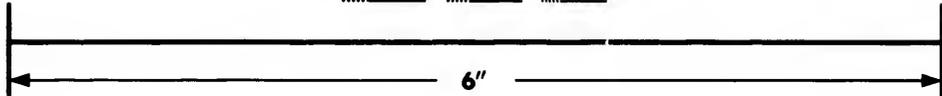
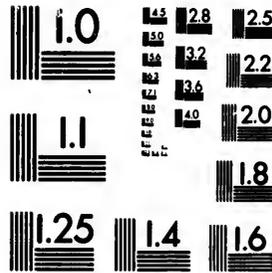


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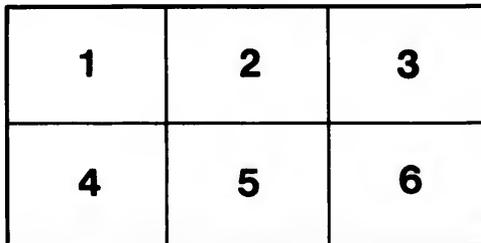
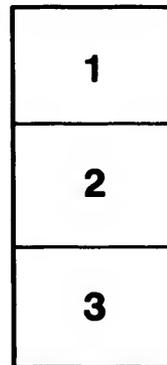
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*Richard Eaton Esq.,
with W. Walker Esq.*

DESCRIPTION
OF THE
"Annular" or "Ring Oven,"

NOW ERECTING AT

**GLEN BRICK WORKS,
TANNERIES WEST,
NEAR MONTREAL.**

With a list of some of those in use in Great Britain.

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DESCRIPTION
OF THE
"Annular" or "Ring Oven,"

NOW ERECTING AT

GLEN BRICK WORKS,
TANNERIES WEST,
NEAR MONTREAL.

With a list of some of those in use in Great Britain.

Vol. 14, cont. 10.

THE PATENT "Annular" or "Ring" Oven,

(NOW ERECTING AT THE GLEN BRICK WORKS.)

A short description of this oven for burning bricks and other articles hereinafter mentioned, and a few facts connected therewith, may be acceptable to parties interested.

The first construction of the oven is costly, the one now erecting at the Glen Brick Works will probably cost, including the patent right, \$10,000. The necessity of extensive solid masonry for foundations costing one-fifth of that sum, but when completed the saving of fuel is to use the words of parties now working them in England, "such as appears at first incredible."

Nearly one hundred of these Kilns are now in operation in Great Britain, and two hundred and sixty on the Continent of Europe, and their erection is going on with increasing rapidity. Several of those now at work have been seen and thoroughly examined by the parties most interested in the construction of this one for the Glen Brick Company, and every possible objection to them has been fully and fairly met and removed. The Architect and Patentee, Mr. Wagner, having been present at the erection of one Kiln at Berlin, Germany, and has witnessed the working of many others. So that the first to be erected in Canada is not to be regarded as an experiment. Its complete success has been fully and permanently established.

In this country, where wood as fuel for manufacturing purposes, is becoming every year, in the larger cities, more costly, the importance of any considerable saving in its consumption demands attention, and as in the case of this oven, it is not necessary to burn wood at all, the advantage is obvious. Small or Dust COAL, TURF, PEAT

or COMPOSITION FUEL, may be fed in through the apertures described, in very small quantities at a time, and from them the Gases are instantly disengaged, and rising into and among the goods, combustion takes place in immediate contact with the articles to be burnt.

The Goods are not burnt by a rapid draught, like what is necessary under the old system to support sufficient combustion; but, on the contrary, the inflamed gas from the fuel fills the whole Burning Chamber, and gently waves onward through and amongst the Ware, filling every portion of the space with an equal temperature, which it imparts to the Goods. The working of the Kiln is under most perfect control by means of the dampers. If desired, it may be burning by day, and so regulated at night as not to require any attention, without lowering its temperature.

The following extract from the very lucid description given in a Lecture delivered by Professor J. THOMSON, before the Chemico-Agricultural Society of Ulster, "On Recent Improvements in the Manufacture of Bricks," will clearly explain its action:—

Professor J. THOMSON, after giving explanations of the Chemical composition and other characters of different kinds of clays, and the changes which they undergo in being burnt or raised to an incandescent heat, explained the chief methods in use for working the clay and forming it into bricks ready for the kiln. He then turned attention to the great loss of heat which occurs in the ordinary modes of burning bricks in common kilns. This great loss, he pointed out, arises in a twofold way. First—During the burning of the bricks, the air which has passed through the fuel, or among the heated bricks, and the smoke including gaseous products generally, passes away from the kiln to waste at a very high temperature, even at a red heat during a considerable part of the process. Secondly—When the bricks are raised to the high temperature required to burn them, and render them permanently hard, the great store of heat which they contain is entirely thrown to waste, while they are left cool. He stated that he had noticed with much interest the very admirable principles of a new kind of kiln with perpetually revolving fire, which, invented and patented in Germany, is being introduced into this country, both for brick-burning

and lime-burning. In this new kiln a most remarkable economy of fuel is effected in a twofold way ; in fact, by saving the twofold loss of heat already mentioned ; for, first, it saves the heat of the gaseous products of combustion and unconsumed air passing through and away from the burning bricks, by applying this heat effectively in drying the new fresh bricks about to be burnt, and raising them up to an incandescent temperature, so that only a very slight addition of heat directly from ignited fuel is required to complete their burning ; and, secondly, it saves the heat of the cooling bricks, after their having been sufficiently fired, by applying it all in warming the air which goes forward to supply the fires : so that the fuel is burnt with air already at an incandescent temperature, instead of requiring, as usual, to heat the air for its own combustion. Professor THOMSON, with the aid of drawings, went on to explain the manner in which these principles are practically carried into effect. The kiln is built in the form of a large arched passage, like a railway tunnel, bending round and going forward on the ground till it closes with itself to form a great circular ring chamber, within which the burning of the bricks is carried on. This ring-chamber may be of any dimensions, depending on the quantity of bricks required for daily delivery. Round its circumference there are twelve entrance door-ways (*a*), admitting of being closed with temporarily-built bricks and clay, so as to retain the heat and exclude all entrance of air by the door-ways so built up. The great ring-chamber may now be conceived as consisting of twelve compartments or spaces, with one of these door-ways to each. In the centre of the ring a high chimney is erected (*b*), and from each of the twelve compartments of the annular chamber an underground flue (*c*) leads into the chimney. There are, then, twelve of these flues converging towards the centre like the spokes of a wheel, and each flue has a valve, (*e*) by which its communication with the chimney can be cut off. Arrangements are made by which a partition like a damper or portcullis (*d*) can be inserted at pleasure so as to cut off all communication between any of the twelve compartments of the ring-kiln and the next one. Let us now suppose the working of the kiln to have been already fairly established, for after being once kindled the fire is never extinguished, but the burning of new Bricks and the removal of the finished produce

is carried on by a continuous and regular process from day to day. Two adjacent compartments (*á á*) have this day their entrance doors open, all the rest being perfectly closed. By the arrangement of the valves in the flues, and the larger damper or porteullis (*d*), the air which gets admittance along by the two open doors (*á*) has to go round the whole circuit of the ring-kiln in order to be drawn into the chimney. From one of the two open compartments men are taking out the finished and cooled bricks, and in the other one they are building up newly formed unburnt Bricks which are not yet quite dry. The air entering by these two compartments passes first among bricks almost cold, and takes up their heat, and then goes forward to warmer Bricks, and then to hotter and hotter, carrying the heat of the cooling Bricks forward with it till it reaches the part of the ring diametrically opposite to the two open and cold compartments. At this place (*e e*) it gets a final accession of heat from the burning of a very small quantity of coal-dust, or other suitable fuel which is dropped in among the bricks from time to time by numerous small openings furnished with air-tight moveable lids. Thus, at this part of the kiln there is generated the full intensity of heat, which is required for the burning of the bricks. The hot air, including the products of the combustion, which, for brevity, we may call the smoke, though it is really perfectly gaseous and free from sooty particles, then passes forward to the bricks, which, by its continuous current, are being heated; and it passes on among them from hot bricks to those who are less and less hot, heating them as it goes, and then passes on to those which are still damp, drying them as it goes; and then it passes to the chimney, in a state almost cold, and saturated with the moisture, in the form of steam or vapour, which it has taken from the damp bricks. On the following day to that on which the operations just described have been going on, the porteullis is shifted forwards by the space of one compartment, and a corresponding change is made as to the flue which is to communicate with the chimney, and as to the pair of compartments open for the admission of air and for the removal of finished cold bricks, and the building in of fresh damp bricks; and the air, including products of combustion, at the ends of its circuit in the annular chamber just before passing

off to the chimney now passes among the fresh bricks which were described as built in on the yesterday of this new day. The place where the coal-dust for fuel is thrown in is also advanced round the circle by the stage of one compartment; and so now the whole process goes on just as it did yesterday. The fire thus makes a complete circuit of the annular chamber in twelve working days, the whole process being left dormant on Sundays, merely by closing of all apertures for the admission of the current of air. The same kind of kiln, with the same process of working, is applicable in the burning of lime; and for both the brick-burning and the lime burning, the saving of fuel, relatively to what is consumed by the ordinary methods, is such as to appear at first sight *almost incredible*.

ADVANTAGES.

Among other advantages which are obtained by the arrangements described, in comparison with the old constructions, are the following:—

- 1st.—The Atmospheric Air necessary for supporting the combustion of the fuel absorbs the heat of the cooling Goods, and supplies the fire of the Furnace with *hot air*, which results in a more favourable and most complete combustion, as well as economising this heat which is usually wasted. On the other side, the superfluous heat from the Burning Chamber contributes to the gradual drying and heating of the Goods to be burnt, so that nothing is lost except what is necessary for supporting the draught in the Chimney. The saving of Fuel arrived at by experience, amounts to the large proportion of from TWO-THIRDS to THREE-FOURTHS of that consumed in ordinary furnaces.
- 2nd.—The apertures through which the furnace receives the combustibles are so placed that at any time the state and progress of the fire in the Kiln can be examined and regulated with

the utmost accuracy. *By this means a product of a very first-rate quality in all its parts can be produced, which could not be obtained in the common Kilns.*

- 3rd.—The charging and emptying of the Kiln can be done at the same time, and without interruption, as each day a Chamber can be filled—another emptied—and one burnt—the remainder cooling and drying. The result is a saving of time, in consequence of which a large and regular supply of Goods can be depended upon.
- 4th.—The height of the Burning Chamber—only 8 or 9 feet—greatly facilitates the putting in and taking out of the articles to be burned, as well as saving injury to the Goods from supporting a great weight when at a very high temperature.
- 5th.—As all the compartments of the Furnace are constantly being emptied in succession, any repairs can be done without interrupting the process; but these Kilns, if properly constructed, are not liable to get out of order.
- 6th.—As the combustibles are thrown into compartments only when at a high heat, any sort of fuel—as Wood, Turf, small Coal, &c.—can be applied. In the use of Coal, the Gas is immediately generated, and filling every part of the Kiln burns the Goods equally. In these kilns there is a total absence of rapid draught. The Gases float gently onwards, filling every part of the Chamber while in a state of perfect combustion.
- 7th.—The Furnace is well adapted for Roasting Ores, Burning Lime, Cement, and Firing Pottery, as well as Bricks; the principle is also applicable to Coke Ovens and Annealing Ovens for Malleable Iron Castings, because the draught can be regulated, and the temperature increased or diminished. and the highest degrees of heat easily obtained and supported.
- 8th.—Besides saving such a large per centage in the quantity of fuel consumed, this Kiln only requires to be supplied with *small Coal*, of comparatively little value, and therefore further reduces the cost of manufacture.
- 9th.—Absence of all Smoke, arising from the perfect combustion of the fuel.

10th.—Freedom from injury to the burning Goods by any sudden change in the temperature, the heat being so gradually absorbed and given out again, no injurious action can arise from the operations being too rapidly performed.

11th.—The cost of *Labour* in Burning is so much reduced that the saving in this item alone is very great.

Further details of the actual results in comparative consumption of Coal, and the opinion of many eminent *practical* men might be added.

A model and drawings of this *Annular* or *Ring Oven* may be seen at the office of the Glen Brick Company, by any of the Stockholders, or by others on permission of the President, and also a list of the places, in Great Britain and Ireland, as well as on the Continent of Europe, where it is now in operation, as well as the testimony, in its favor, from parties now using it,—one of which is from Henrich Driesch, of Vienna, probably the largest Brick makers in the world, and from Messrs. Joseph Cliff & Son, of Watley, near Leeds, England, and many others.

The following is a list of Ring Ovens, in use in Great Britain, up to Spring of 1867:—

The Right Honorable the Lords of the Admiralty—to burn 75 millions of Bricks.	No. of Kilns.
The Aylesford Pottery Co., Kent, (1 single, 1 double).....	3
The Cliff Fire-Clay Co., Crigglestone, near Wakefield.	1
The North London Brick Co., Holloway.....	1
The Dorking Grey Stone Lime Co., Surrey.....	2
The Swan Bank Brick Co., Halifax.....	1
Bradford Colliery Co., Manchester.....	1
Messrs. Peto, Betts, Kelk, and Waring Bros., Kensington (2 double Kilns).....	4
Messrs. Waring Bros., King's Cross, (1 double, 1 single Kiln)...	3
The Avon Bank Brick and Tile Co., Bristol.....	1
Messrs. W. Thomas & Co., Wellington, Somerset.....	1
Messrs. J. & A. Glover, Longton, Staffordshire Potteries.....	1

	No. of Kilns.
Messrs. R. Beart & Co., Arlsey.....	1
Messrs. Bradley & Craven, Wakefield.....	1
Messrs. Josh. Cliff & Son, Fire-Clay Works, Wortley, Leeds.....	2
Messrs. W. Ingham & Sons, Fire-Clay Works, Wortley, Leeds..	1
Messrs. Longley & Co., Leeds.....	1
The Leeds Patent Brick Co., Leeds.....	1
Messrs. Platt, Bros. & Co., Oldham.....	1
Messrs. Keith & Harriman, Aberdeen.....	1
Mr. George Furness, Burham, Kent, (1 double Kiln).....	2
Mr. Geo. Jennings, South Western Pottery, Poole.....	1
Mr. W. Hicks, Barnet, Herts.....	1
Mr. O. Wilson, Malvern.....	1
Mr. W. Mansfield, Birmingham.....	1
Mr. T. Bennett, Derby.....	1
Mr. E. Dusautoy, Derby.....	1
Mr. E. Ensor, Woodville Fire-Clay Works, Burton-on-Trent....	1
Mr. R. Beart, Huntingdon.....	1
Mr. R. W. Hunt, Otley.....	1
Mr. J. Saner, Hull.....	1
Mr. W. Benson, Newcastle-on-Tyne.....	1
Mr. J. Richardson, West Hartlepool.....	1
Mr. A. J. Woodhouse, Barrow-in-Furness.....	1
Mr. W. Barry, Scarborough.....	1
Mr. John Moore, Belfast (1 double Kiln).....	2
Mr. R. Murland, Castle Espie Lime Works, County Down.....	2
Mr. Wilson Oliver & Co. Butt near Worcester.....	1
Mr. J. Marsden, Bolton, Lancashire.....	1
Mr. B. C. Lawton, Durham.....	1
Hook & Co. Reigate, Surrey.....	1
Mr. J. E. Howl, Staffordshire	1

The Glen Brick Co., have secured the exclusive right for the "Ring Oven" for Montreal and its vicinity.

JOHN LEEMING,
President Glen Brick Co.,

MONTREAL.

Montreal, Feb. 1869.

