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WHAT IS A BRICK?

What is a brick? We hear some of our readers exclaim how simple a question!—while the reply spontaneously arises—varied by circumstances, but alike in its general significanc—that a brick is a square-sided piece of burnt clay, used for building houses, walls, and for other similar purposes; or some of our "faster" and more juvenile friends may even vary the information, by unconsciously retailing, as original, the expression of the Greek of old, and favor us with the definition "that a brick is a jolly good fellow, and that they are ready to introduce us to a whole host of specimens, at any favorable opportunity." Admitting the general accuracy of the above replies—both of which to their extent are alike correct, and comprehend collectively perhaps, the whole amount of information which is thought needful on so common-place a topic—we will venture, for the edification of those who may wish to go beyond the surface of a subject, to give our own ideas of a brick, and then to append a few particulars respecting an improved mode of manufacture of so important an article. A brick is in the present day, an essential element in building, and has under various forms, been more or less so from the earliest ages. Whether in civilized or savage life the brick in its burnt or unburnt state supplies a most important desideratum to social comfort, and thus becomes of almost universal importance. To the inhabitants of this neighbourhood, however, a brick presents another feature, stamping it with an extraneous value as one exponent of the vast mineral wealth of the district, and of the extensive and important trade which may accrue to the port of Poole and the surrounding country from its increased manufacture; and is therefore, in this point of view, deserving of more than a casual notice.

The trade in clay from this part of the county of Dorset, continued until very recently to be carried on for one branch of manufacture alone. Pipe-clay—so called—either of the finest or coarser descriptions, appears to have been for a long period the only marketable article; the pottery trade requiring this description of clay only. Within a few years, the invention of stone-ware pipes, and subsequently their increased demand for sanitary purposes, gave a fresh direction to the trade, calling into more active use the coarser and hitherto almost unmarketable earths; and what is still more to the advantage of the neighbourhood, occasioned the erection of the several large manufactories which we now see around us, and—as a consequence—furnished occupation to a considerable number of our labouring population. Even yet the various uses to which the Poole clay might be profitably applied have not completely developed themselves. From a more critical examination of some of the veins, it was suggested that their properties much resembled those of the wide-fame clay of Stourbridge, and that it might equally be adapted to the purposes of fire-bricks. Experiment soon proved the truth of the theory;—a few bricks were roughly manufactured, exposed to the test of intense heat, and were actually found to surpass, in their perfect indestructibilty under its operation, those of any other locality. Here then was a fresh impulse to the manufacturing interest of the district, and a new market opened up—unlimited in its extent, as is the use of the article supplied—applicable under the various forms of bricks, lumps, and other technical appellation to every branch of art in which the use of the furnace is in any way involved. The adaptation of the raw material being thus ascertained, and the possibility of converting it from comparatively useless soil into an article of merchandise being at the same time decided, it next becomes a question how this latter operation shall be performed to the best advantage—that is to say, by what means the largest amount of bricks can be furnished, of superior quality and at the lowest price; and before we proceed to describe the means exployed to effect these objects, we will just glance at what a brick was, and how it was manufactured, from the earliest days until a very recent period. The clay, under the original (and in the great majority of cases the present) system, was first dried, ground to powder—sifted—again wetted and blended into a tenacious paste.

In this form it was submitted to the hands of the "slop moulder," who, by manual labour alone, compressed a piece of clay of about the required size into a wooden box or mould, of the requisite dimensions (in the case of common bricks, 9 inches long $4\frac{1}{2}$ inches wide, and $2\frac{1}{2}$ inches thick); he then swept off the superfluous portion, and inverting the mould he produced his bricks one by one; thus limiting the supply to the number which could be produced by the unaided agency of hand labour, and necessarily enhancing the price in a due proportion. The bricks thus formed, were yet in a soft and wet state, requiring exposure to the air for a space of six weeks before the moisture was sufficiently evaporated to enable them to bear the action of fire in burning; and during this period, as well as in the process of making, much loss and difficulty resulted from atmospheric changes. No attempt appears to have been made to obviate this primitive mode of manufacture, until the removal of the duty by Sir Robert Peel. The excise regulations—previous to that time—having been so harrassing to the manufacturer as virtually to exclude the intervention of machinery. This impediment removed, a new stimulus was afforded, and scientific men immediately undertook the task of substituting mechanical agency for the previous manipulation; and so general appears to have been the attempts for this purpose, that in about 20 years we find no less than 250 patents registered with this object; nor is this surprising, when the almost universal demand is taken into consideration—the number of bricks at present made amounting to little less than two thousand millions per annum; and the loss during the various stages of the hand process being at the same time so considerable, that the allowance of the excise on this account amounted to 10 per cent.

Among the early improvements in the mode of manufacture, was the attempt to substitute dry clay for the wet mass. This originated with Mr. Prosser, a Birmingham engineer, who took out a patent "for the manufacture of buttons and tessera from pulverized clay." Under Mr. P.'s process the clay, was washed—dried—powdered, and sifted through the finest muslin; and in that state exposed to pressure in the required mould, under the influence of a machine resembling a coining press. This was attempted to be applied to the manufacture of bricks, but from the tediousness of the operation, one great objection to the old plan of manipulation still remained; though the bricks produced were far superior in quality and finish. The hint thus afforded was speedily followed up, and at length a machine was produced uniting the good qualities of its predecessor with a very increased degree of speed; and it is of this engine, which is at present in full action at the Kinson Clay Works, that we subjoin a description. We should premise that the

machine is the invention of Mr. Thomas Burstall, engineer to the London Patent Brick Company, and that it is to that gentleman's kindness we are indebted for the following particulars, which may be interesting even to those of our readers not engaged in scientific or mechanical pursuits :—

Two sets of machinery are employed, viz., the grinding apparatus and the "brick machine." In the first, the dry clay is made to pass under rollers, fixed above a revolving pan, in the periphery of which are gratings about $\frac{1}{8}$th of an inch wide, with scrapers so adjusted as to alternately bring the clay under the rollers and over the gratings. Below this pan is a receiving box, communicating with the hopper of the brick machine, into which the sifted clay is swept.

The brick machine consists of strong framings, to which are attached two dies, or moulds. In these dies are two plungers which are acted on underneath by a steam press, and above by two eccentrics, to which are also attached two plungers working into the dies at the top part of the mould. At the back is a simple apparatus for feeding the moulds with dry clay—throwing up the brick—and pushing it off when finished. The machinery being set in motion, the pan revolves—the clay is thrown in—passed under the roll by the scraper—crushed, and after one or two more revolutions, swept into the hopper of the brick machine, and, falling by its own gravity into the feeding box, is deposited in one of the moulds; on the return stroke of the engine, the surplus clay is struck off, and the revolving shaft brings down the eccentric with the plunger connected, into the top of the die on the loose clay. When this plunger is fairly within the die, a valve opens, giving motion to a piston—and through the medium of a beam—to the plunger below, and pressing the brick with *a perfect elastic pressure*. The shaft continuing to revolve, the eccentric rises up, bringing the plunger out of the mould, the brick is thrust up, and is then pushed on to a table by the box returning with a charge of clay, and the process is continued *ad infinitum*; meanwhile alternate machinery is performing exactly the same motions, so that two bricks are produced at every revolution of the machine.

The bricks when pushed on to the table are now ready for the kiln, and are square, smooth, the edges sharp, and body very solid, having received a pressure of more than 20 tons. They are placed on barrows, wheeled to the kilns, and at once fired; the whole process being carried on at upwards of 1000 bricks per hour.

The predominant and distinguishing feature of the invention is the use of elastic pressure, by which means any defined amount of force may be employed, whilst it is perfectly under command. This engine, though perfectly adapted to the manufacturing of bricks of any kind, is yet more especially so to fire-bricks, as the degree of granulation in the dry clay can be regulated by altering the size of the gratings.

Thus then we find brick-making almost elevated to the level of an art; and the extent of productive power, to be limited only by that of the materials employed. Here the Kinson Clay Company appears to be eminently fortunate, possessing an almost inexhaustible vein of clay, equalling, if not surpassing—as before remarked—the clays of Stourbridge. Instigated by this fact, the Company have in earnest set themselves to the work of improving their advantages, having largely increased their premises, and become the sole licensers of the machine for the southern district, comprehending a space of upwards of 700 miles. Of the quality of the goods manufactured, we are enabled to speak from experience in our own neighbourhood; the bricks having been exposed to the severest trials, both in the

foundry of our worthy Mayor and in the Poole gas works.*

That we have in the above notice referred more especially to fire-bricks than to bricks in general, arises from the fact that the earth from which they are formed is rarely to be met with; and this branch of trade therefore less open to competition than in the common description. That which the machine can produce from one description of clay however, it can as readily do from another, and the front of our police office attests that of other materials of superior quality there is no lack. We trust e'er long to find Mr. Burstall's machine not an individual object of curiosity in our neighbourhood, but rather common to all our clay companies; and that working—as at the Kinson pits—conjointly with the Patent Pipe Machine of Mr. Pearce, it may conduce to place the clay trade of Poole beyond question of competition with the Lambeth and Northern Potteries. With raw material to infinity, and such appliances of conversion, added to a daily extending market, but one element to complete success remains, namely, facility of transit. The same energies which have already surmounted many obstacles will doubtless be brought to bear upon this, and a better season for its exertion will perhaps rarely be found than is now opening upon us. Railways—in course of formation or projection—are now throwing their net-work around us. Our Potteries—one and all—are well situate to avail themselves of such aid, and by a very short intervention of its agency, facilities of conveyance to all parts of the world are offered, equal if not superior to those of any port in the kingdom. If due advantage is taken of these opportunities, the benefit will not be to the potteries alone but to the population at large; and under this aspect we may conclude, by offering as another reply to our introductory question, that a brick *may be made* to constitute a germ, from which incalculable benefits must result.