No. 727,114. PATENTED MAY 5, 1903.

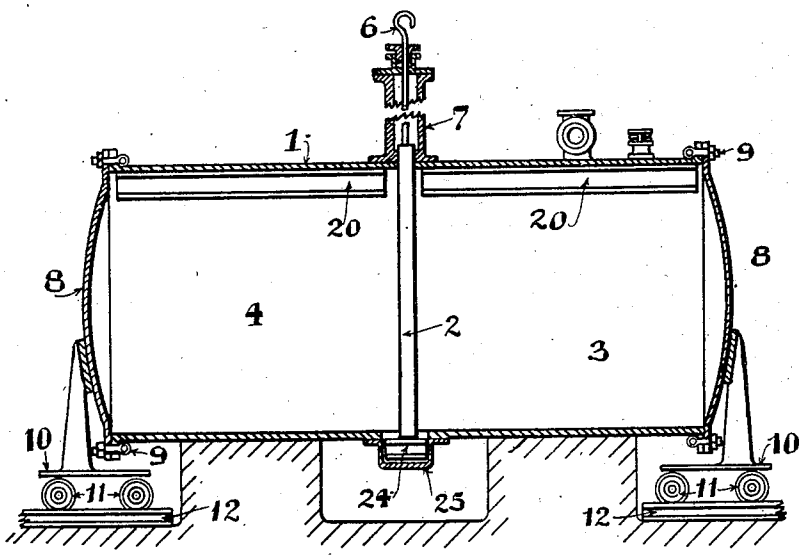
E. EATON.

APPARATUS FOR MANUFACTURING BRICKS.

APPLICATION FILED FEB. 16, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.




Witnesses—

Benjamin Blank

Charles H. Briggs.

Inventor:—

Edmund Eaton.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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APPLICATION FILED FEB. 16, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig 2.

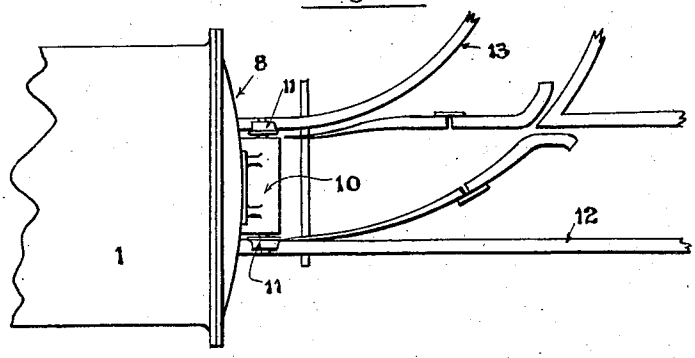
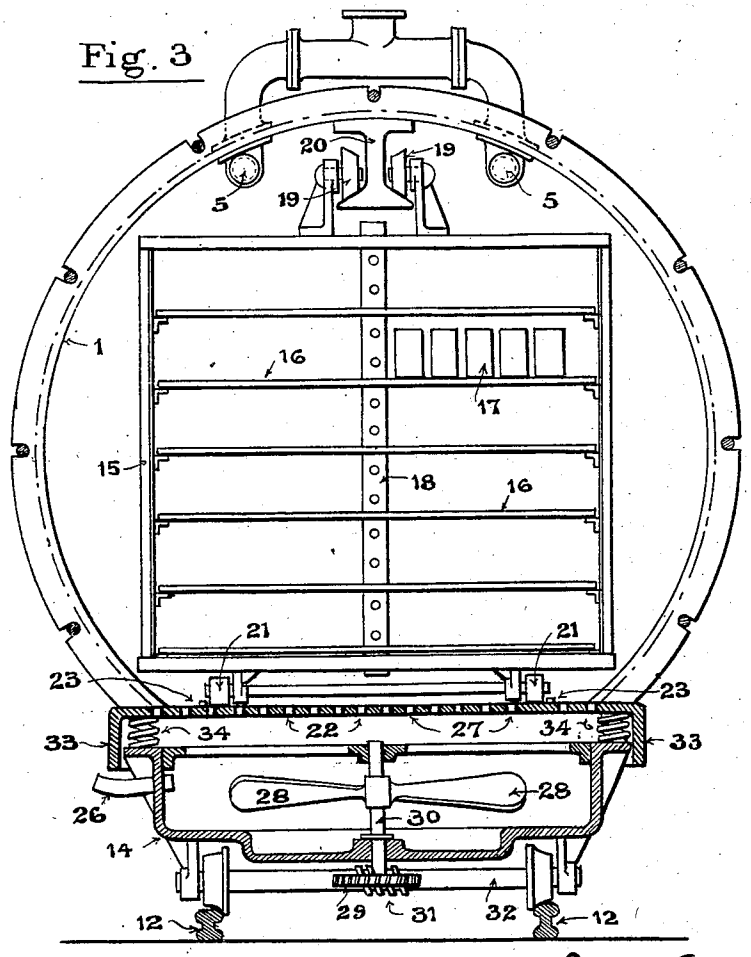



Fig. 3




Witnesses:—
Benjamin Blank.
Charles H. Briggs.

Inventor:—
Edmund Eaton

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 727,114. Patented May 5, 1903.

# UNITED STATES PATENT OFFICE.

EDMUND EATON, OF LONDON, ENGLAND.

## APPARATUS FOR MANUFACTURING BRICKS.

SPECIFICATION forming part of Letters Patent No. 727,114, dated May 5, 1903.

Application filed February 16, 1903. Serial No. 143,636. (No model.)

*To all whom it may concern:*

Be it known that I, EDMUND EATON, a subject of the King of Great Britain, and a resident of London, in the county of London, England, have invented certain new and useful Improvements in Apparatus for Manufacturing Bricks, (for which I have applied for patents in Great Britain, Nos. 2,371 and 2,372, dated January 31, 1903, in the names of Eaton, Pfeifer, and Briggs,) of which the following is a full, clear, and exact specification.

The manufacture of building-bricks, blocks of artificial stone from sand, clinkers, quartz, and various waste material or refuse in conjunction with an admixture of lime and a hardening steaming-chamber, has hitherto been made under various processes, none of which have been able to produce an article of the requisite cohesion, strength, and reliability which is absolutely necessary in a substitute for a hard-burned kiln or clamp brick composed of clay. The bricks or stone manufactured on the present systems have been found by practical experience up to the present time to be insufficiently tenacious, friable, too porous, and lacking those qualities which are required of a good building brick or block—viz., hard, tough, not easily broken, and capable of resisting fire and moisture without crumbling and of being transported without damage, particularly to the edges, and of strong cohesion. To overcome these defects and to produce a desirable and solid article, I have introduced certain improvements in the apparatus for dealing with the material of which the bricks or blocks may be composed, which I will hereinafter describe.

It is important that the lime, which forms an important feature in the manufacture, be completely slaked to powder and mixed, so that no unslaked particles are contained in the material, bricks, or blocks when they are placed within the drying-chamber, which I shall hereinafter illustrate and which may be heated by steam, superheated steam, hot air, furnace-gases, or carbonic-acid gas. (The latter may be produced within the drying or annealing chambers by slaking a quantity of lime.) Furthermore, it is of importance that the drying and annealing chambers be at a certain temperature when the bricks or blocks or other materials are placed within same and that for the drying-chamber the temperature be gradually raised until a pressure is obtained of about one hundred and twenty pounds per square inch, which should be maintained invariable as near as possible for twelve to sixteen hours. Any sudden or variable temperature is liable to adversely affect the bricks. I find it an advantage to utilize the smoke or hot gases from the boiler-furnace or exhaust-steam for warming the steaming-chamber, and I may therefore provide a flue or flues under the steaming-chamber and pass the hot gases thereto from the boiler-furnace. This serves the dual purpose of rendering the same smoke consuming or condensing and at the same time assists in keeping up the steam-pressure inside the steaming-chamber or for warming the chamber prior to the steaming. It is also important that the steam be dry and as free from moisture as possible and that the bricks on being withdrawn from the steaming-chamber should gradually be cooled down in a cooling or annealing chamber, which is heated by exhaust-steam from the steaming-chamber, which I will presently describe.

It is very desirable in withdrawing the articles from the steaming-chamber that they should be carefully handled, as until the bricks or blocks are cooled they are most liable to be damaged as a consequence of any shock or vibration. It has been found by experience that when the bricks or blocks are stacked one upon the other on the trucks or wagons prior to entering the steaming or drying chamber not only are they subject to vibration, but that the weight of the upper part of the stack upon the lower rows of bricks renders many defective bricks or stones, and to overcome these objections I arrange the bricks in the steaming or drying chamber on a special cage or framing which runs along within the chamber on a single rail suitably arranged at the top of the steaming-chamber and extending into the annealing-chamber, as hereinafter described. In combination with the cage or framing aforesaid I employ an improved form of truck or cage for conveying the molded bricks or blocks from the press to the steaming or drying chamber, the top of which forms a platform upon which the cage aforementioned may rest and which

is suitably attached and detached to the under carriage of the aforesaid truck and has suitable springs interposed between same and the under carriage, so as to reduce the vibration to a minimum.

Referring to the annexed drawings, Figure 1 is a sectional side elevation of the combined steaming and annealing chambers. Fig. 2 represents a plan view of one end of same, particularly showing the arrangement of the rails for facilitating the movement of the ends or covers and of the truck supporting the bricks and the like to be steamed. Fig. 3 is an end view of Fig. 1 to an enlarged scale, also showing the truck and framing for supporting the bricks or the like partly in section.

The combined hardening or steaming and annealing chambers consist, preferably, of a cylindrical-shaped vessel 1, supported in any suitable manner and provided with a sliding partition or door 2, thus dividing the whole into two distinct compartments 3 and 4, the compartment 3 being employed as the steaming-chamber and provided with the perforated steam-pipes 5, also a safety-valve and pressure-gage, while the compartment 4 forms the annealing-chamber. The partition or door 2 is operated through the medium of a rod or rods 6, passing through stuffing-boxes at the top of the steam-tight casing 7. The lower half of the partition or door may be semicircular in shape and the whole slide within a groove or recess formed in the sides of the chamber 1. Each end of the chamber is provided with removable steam-tight covers 8, which may be readily secured in position by pivoted or eye bolts 9, as shown. The covers 8 are mounted upon small carriages 10, supported on flanged wheels 11, free to run on rails 12, thus greatly facilitating the moving of the covers when required.

When a quantity of bricks are ready for steaming, the compartment 3 is warmed up, its cover 8 removed and run on to a branch line 13, Fig. 2, the truck 14, supporting the case 15, containing the bricks, is run along the lines 12 to the steaming-chamber. The cage 15 is provided with perforated sliding shelves 16, upon which the bricks are placed, as shown at 17, Fig. 3, said shelves being in halves and slide in from two opposite sides of the cage and meet at a central perforated steam-pipe 18. The top of the cage 15 has two pairs of beveled wheels 19 attached thereto, engaging with and free to run upon the rail 20, attached inside and along the top of the compartments 3 and 4, as shown. The bottom of the cage 15 is also provided with a set of small wheels 21 to facilitate the removal of the cage from the top 22 of the truck 14, said top 22 being provided with parallel ridges 23 to act as guides to the wheels 21, and thus insure the cage 15 being in correct position for the engagement of the beveled wheels 19 with the rail 20. The cage 15 is now pushed into the compartment 3, the truck 14 run back to the molding-department in readiness for the next load of bricks, and the cover 8 placed in position. Steam is now admitted to the compartment (through the medium of the perforated steam-pipes 5) for the desired period, when the supply would be shut off and utilized to warm the annealing-chamber and the partition or door 2 raised. The same cover 8 is again removed and the cage 15 run into the annealing-compartment 4, which has previously become warmed, due to the radiation of heat from the compartment 3 or use of exhaust-steam or boiler-gases. The gap formed between the two lengths of rails 20 is filled by a gap-piece 24 when the partition or door 2 is in its raised position, said gap-piece 24 being attached centrally to the bottom of said partition or door and fits into a recess 25 when in its lower position. The cage 15 is withdrawn from the annealing-compartment 4 by removing its cover 8 in a similar manner to the cover of the compartment 3, as aforedescribed. The truck 14, upon which the cage 15 is supported, is so shaped as to form a receptacle for containing lime or the like, so that a preliminary drying process may take place while the cage of bricks is being run from the molding-department to the steaming-chamber. Water or steam may be admitted to the lime by means of a short pipe 26, and the hot gases given off pass through perforations 27 in the top plate 22, the perforated shelves 16, and pipe 18. A mixer or agitator 28 is revolved through the medium of a worm-wheel 29, attached to the spindle 30, and a worm 31, formed upon one of the axles 32, as shown. The top 22 has a flange 33 formed around same and is supported by the truck 14 through the medium of a series of springs 34, thus reducing the vibration of the bricks or the like to a minimum, as aforementioned. The cage 15 should be longer than the truck 14, so that the first pair of bevel-wheels 19 may engage with the rail 20 before the truck 14 is flush with the end of the chamber 1.

It will be seen that any desired number of cages 15 may be placed within the compartments 3 and 4 during the same period, according to the dimensions of same.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In apparatus for the manufacture of bricks or blocks from sand, lime, ashes and such like, the combined steaming and annealing chambers comprising a cylindrical-shaped vessel having removable steam-tight doors at each end thereof, a central sliding partition, a rail along the interior and at the top of said chambers, a gap-piece attached centrally to the bottom of said partition and adapted to fill the gap between the two lengths of said rails; carriages mounted upon wheels and supporting the steam-tight doors aforesaid, substantially as described herein.

2. In apparatus for the manufacture of

bricks or blocks from sand, lime, ashes and such like, the combination with the combined steaming and annealing chambers, comprising a cylindrical-shaped vessel having removable steam-tight doors at each end thereof, a central sliding partition, a rail along the interior and at the top of said chambers, a gap-piece attached centrally to the bottom of said partition and adapted to fill the gap between the two lengths of said rails; of a truck mounted upon wheels and shaped so as to contain lime, a flanged perforated top, springs interposed between said perforated top and the truck aforesaid, an agitator mounted upon a spindle and driven in any well-known manner, a cage mounted upon wheels and supported by but independent of said truck, two pairs of beveled wheels at the top of said cage adapted to engage with the rail aforesaid, perforated shelves contained within said cage and upon which the bricks or blocks are mounted substantially as described herein.

In testimony that I claim the foregoing I have hereunto set my hand this 6th day of February, 1903.

EDMUND EATON.

Witnesses:
BENJAMIN CLARK,
WILLIAM JOHN WEEKS.