F. W. BUTTERWORTH.

BRICKMAKING MACHINE.

APPLICATION FILED DEC. 27, 1915.

1,193,871.

Patented Aug. 8, 1916.

2 SHEETS—SHEET 1.

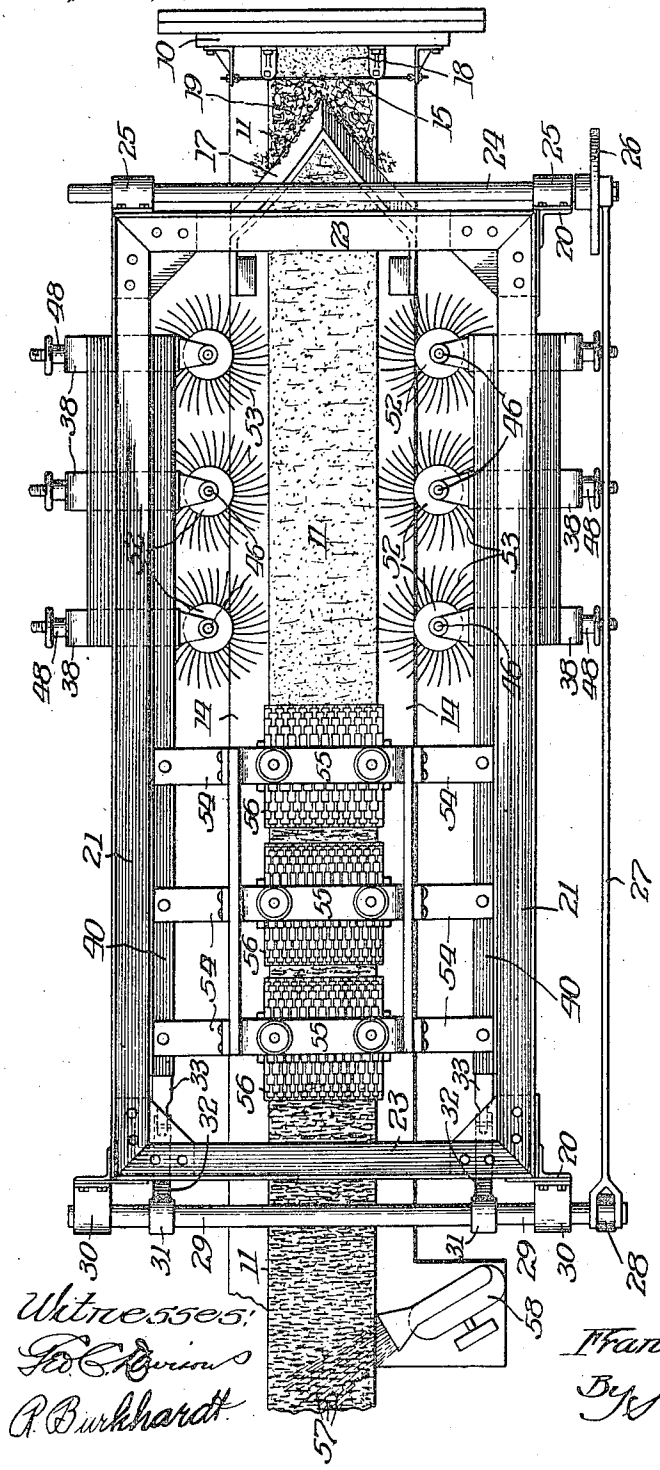


FIG. 1

Witnesses:
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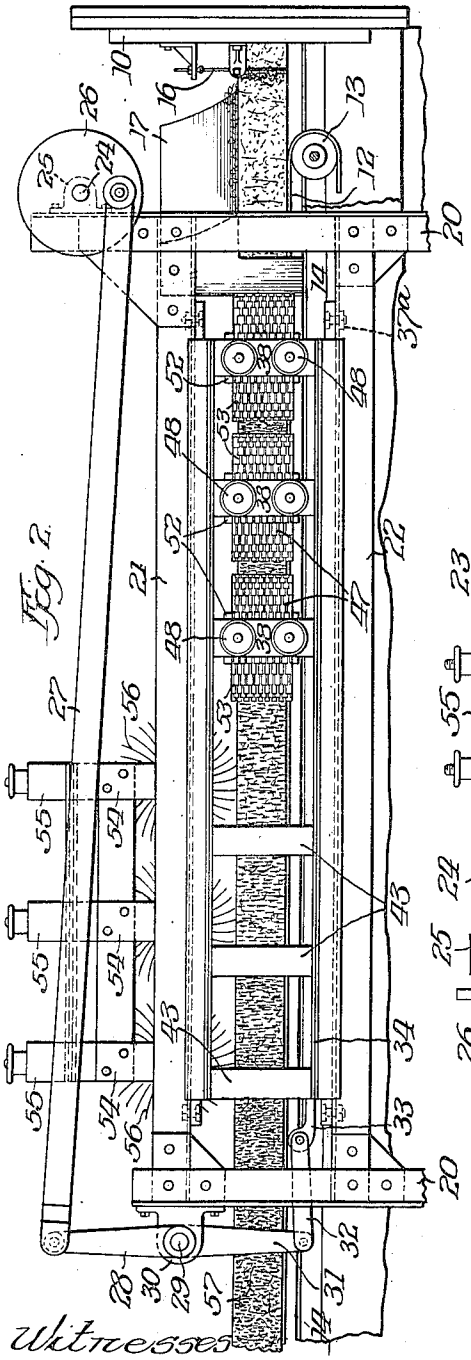


Fig. 2.

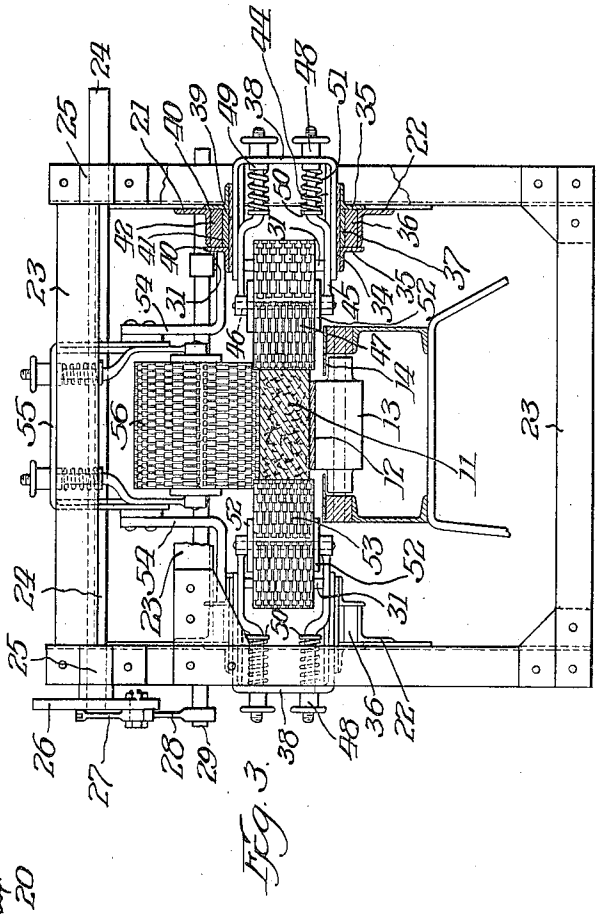


Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

FRANK W. BUTTERWORTH, OF DANVILLE, ILLINOIS.

BRICKMAKING-MACHINE.

1,193,871. Specification of Letters Patent. Patented Aug. 8, 1916.

Application filed December 27, 1915. Serial No. 68,742.

To all whom it may concern:

Be it known that I, FRANK W. BUTTERWORTH, a citizen of the United States, residing at Danville, in the county of Vermilion, in the State of Illinois, have invented certain new and useful Improvements in Brickmaking-Machines, of which the following is a specification.

My invention relates to brick-making machines, and refers particularly, although not exclusively, to machines for treating the surface of a ribbon of ceramic material before the latter is cut into bricks and subjected to the heating operation in kilns.

In my co-pending application Serial No. 45,236, filed August 19, 1915, I have described a machine for treating the surface of a clay-ribbon in order to cause the surface of the finished brick to be roughened without having predominating lines extending in any direction, while at the same time the light effect produced on the brick is soft and light-absorbing rather than light-reflecting. In the application just mentioned one of the machines which I described comprised a plurality of rotatable brushes having resilient bristles of steel or other suitable material thereon. These brushes engaged one or more of the surfaces of the clay-ribbon as the latter was extruded from a brick-making press of the usual and well-known type. The brushes were so located that they acted on the surface of the clay-ribbon after the outer skin of the latter had been removed by wire or other similar means. These brushes, on account of their resilient engagement with the surface of the ribbon, removed small particles of clay from the latter by a "picking" action as the individual bristles became disengaged from the clay-ribbon. The surface of the ribbon was thereby covered with a large number of minute indentations, and the surface of the finished brick was thus given a soft and pleasing effect.

It is the object of my present invention to produce a brick of the same characteristics as that described in my previous application, but to obtain this result by an improved machine which will operate more expeditiously and economically than was the case with the machine of my co-pending application. I accomplish this object by mounting the rotatable brushes of my former invention so that the resilient bristles of these brushes engage the surface or surfaces of the clay-ribbon to be treated. The brushes are so mounted that their engagement with the ribbon is controlled by resilient means, such as springs, thereby allowing the brushes to accommodate themselves to any slight inequalities in the surface of the ribbon and to maintain a substantially uniform pressure in their engagement with the ribbon. These brushes are mounted in a frame, which, by suitable mechanism, is given a reciprocatory movement in a direction transverse to the axes of rotation of the brushes. In this way it will be evident that not only are the brushes rotated by the movement of the clay-ribbon itself, but the number of times that the bristles of an individual brush are brought into engagement with the surface of the ribbon is increased on account of the reciprocatory movement of the brush as a whole. In this way the efficiency of each rotatable brush is greatly increased, and the number of brushes which it is necessary to use on one machine in order to get the desired result may be greatly decreased over the number of brushes which it was necessary to employ in connection with the machine of my former invention.

These and other advantages of my invention may be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a plan of my improved brick-making machine; Fig. 2 is a side elevation of the machine shown in Fig. 1; and Fig. 3 is a transverse section and partial end elevation of the machine shown in Figs. 1 and 2.

A brick-press, of any well-known type, is provided with the die 10, from which is pressed the clay-ribbon 11, which is received on the endless conveyer belt 12 which passes around sheaves or pulleys 13. A table or platform 14 is provided which has a surface at a slightly lower level than that of the belt 12. A horizontal wire 15 and the two vertical wires 16 are provided near the mouth of the die 10, the horizontal wire 15 serving to remove a thin layer from the upper surface of the ribbon 11 as it comes from the die 10, and the wires 16 performing a similar function with reference to the sides of the clay-ribbon. Although in the following description of my invention I have described the latter as adapted for the treatment of the upper and two side sur-

faces of the clay-ribbon, it will be evident that only one or two of these surfaces may be treated without any departure from the spirit of my invention.

The plow-shaped member 17 supported on the table or platform 14 serves to remove from the upper surface of the clay-ribbon the layer of material shaved therefrom by the wire 15. The clay-ribbon 11 as it leaves the die 10 has a smooth surface, as indicated in the portion 18 of the ribbon. The wires 15 and 16, however, serve to roughen the surface of the ribbon, in the manner shown in the portion 19 of said ribbon, a number of more or less fine transverse cracks being formed in this surface.

A stationary framework for the machine is formed by the four corner posts 20, to which are fastened the upper longitudinal angle-irons 21, the lower longitudinal angle-irons 22, and the upper and lower transverse angle-irons 23. The transverse shaft 24 is mounted in bearings 25, which are carried by the posts 20. Mounted on one end of the shaft 24 is the disk 26, to which is pivotally and eccentrically connected the link 27, which, at its opposite end, is pivotally connected with the arm 28 carried on the shaft 29, which, in turn, is mounted in bearings 30 carried by the posts 20 at the opposite end of the machine. It will be evident that on rotation of the shaft 24 from any suitable source of power the rotary movement of the disk 26 by means of the link 27 and the arm 28 will be converted into a rocking movement of the shaft 29.

Rigidly mounted on the shaft 29 are the two downwardly-projecting arms 31. The lower end of each of these arms is connected by means of a link 32 with the member 33, which is attached to the plate 34 of the reciprocatory brush-holding frame, which will next be described.

Each of the plates 34 has attached thereto the angle-irons 35, the vertical members of which engage on their inner surfaces the sides of the bearing track 36 fastened to the lower angle-iron 22 by means of the bolts 37^a. The plate 34 also carries on its lower surface between the angle-irons 35 the bearing plate 37, which engages the bearing track 36. The members just described are duplicated on the two sides of the machine. To the plates 34 are fastened the U-shaped yokes 38, the upper horizontal arms of which are fastened to the upper plates 39, which, in turn, carry the angle-irons 40, similar to the angle-irons 35 just described, and the bearing plate 41. Each of the angle-irons 21 carries a bearing track 42, similar to the bearing tracks 36, the bearing tracks 42 being permanently fastened to the angle-irons 21 and engaged at their sides by the angle-irons 40. It will be evident that the yokes 38 serve to connect the plates 34 with the plates 39 so that these plates are moved in synchronism. The braces 43 also extend between the plates 34 and 39 to assist in holding the latter in position.

Each of the yokes 38 is provided with a longitudinal projection 44, which is engaged by a corresponding groove in each of the pair of brush-retaining members 45, between the inner ends of which extends the shaft 46 on which a brush 47 is mounted. The outer end of each brush-retaining member 45 extends through a suitable aperture in the yoke 38, and is threaded for the reception of the nut 48. Between the washer 49, mounted on the brush-holding member 45, and engaging the inner surface of the yoke 38, and the collar 50 rigidly mounted on this member 45, is a spring 51, which serves to move the brush-holding member 45 inwardly until the nut 48 engages the outer surface of the yoke 38.

Each of the brushes 47 consists of a hub 52, on which are mounted the resilient bristles 53, of steel or other suitable material, these brushes preferably having a slight curvature, as most clearly shown in Fig. 1. The brushes 47 are so positioned that the bristles 53 engage the sides of the clay-ribbon 11.

Extending from each of the inner angle-irons 40 are the connecting members 54, which serve to support the yokes 55 of the same construction as the yokes 38. These yokes, by means of exactly the same mechanism as is employed in connection with the yokes 38, resiliently support the horizontally-disposed brushes 56, similar to the brushes 47, and which engage the upper surface of the clay-ribbon 11.

Having thus described the various parts which are used in connection with my invention, the operation of the same may now be readily understood: The clay-ribbon 11, after leaving the die 10 and having removed from its upper and side surfaces the hard outer skin of clay, is carried onwardly by the conveyer belt 12, and is first brought into engagement with the side brushes 47, which are rotated by the movement of the clay-ribbon itself. As the bristles 53 engage the sides of the clay-ribbon, these bristles are slightly bent while sinking into the surface of the ribbon and making minute indentations therein. As each bristle is on the point of leaving the surface of the clay-ribbon by reason of the rotation of the brush, the resiliency of the bristle causes it to straighten somewhat and thereby perform a "picking" action on the surface of the clay-ribbon and remove a small particle of clay. At the same time, the shaft 24 is rapidly rotated from any suitable source of power, thereby causing the shaft 29 to be rocked and correspondingly reciprocating the plates 34 and 39 which are connected

with the yokes 38 which carry the brushes 47. This rapid reciprocation of the brushes causes the bristles to engage the sides of the clay-ribbon a large number of times, and the "picking" or stippling action of these brushes is thereby greatly increased. At the same time, the horizontally-disposed brushes 56 perform the same action on the upper surface of the clay-ribbon at a more advanced portion thereof, and the brushes 47 and 56 engage the surfaces of the clay-ribbon with a substantially uniform pressure by reason of the action of the springs 51, the tension of which may, of course, be changed by proper regulation of the nuts 48.

After the surfaces of the clay-ribbon 11 have been subjected to the action of the brushes 47 and 56, these surfaces are covered with minute indentations, as diagrammatically shown in the portion 57 of this ribbon. In order to remove any clay which may remain on the upper surface of the ribbon I may employ a blower 58, or the like, as shown in Fig. 1.

It will be apparent to those skilled in the art that many changes could be made in the detailed construction of the various parts which I have described without departing from the spirit or scope of my invention, as defined in the appended claims.

What I claim is:

1. In a brick-making machine, the combination of a rotatable brush having resilient bristles thereon adapted to engage the surface of a moving ribbon of ceramic material whereby said brush will be rotated, and means for reciprocating said brush.

2. In a brick-making machine, the combination of a rotatable brush having resilient bristles thereon adapted to engage the surface of a moving ribbon of ceramic material whereby said brush will be rotated, and means for reciprocating said brush in the direction of movement of said ribbon.

3. In a brick-making machine, the combination of a brush having thereon a plurality of bristles adapted to engage the surface of a moving ribbon of ceramic material, and means for resiliently mounting said brush.

4. In a brick-making machine, the combination of a brush having thereon a plurality of bristles adapted to engage the surface of a moving ribbon of ceramic material, means for mounting said brush to permit its movement toward and away from said ribbon, and spring means for holding the bristles of said brush in resilient engagement with the surface of said ribbon.

5. In a brick-making machine, the combination of a rotatable brush having thereon a plurality of resilient bristles adapted to engage the surface of a moving ribbon of ceramic material, means for mounting said brush to permit its movement toward and away from said ribbon, and spring means for holding the bristles of said brush in yielding engagement with the surface of said ribbon.

6. In a brick-making machine, the combination of means for extruding a ribbon of ceramic material, a conveyer for said ribbon, a rotatable brush having resilient bristles adapted to engage the surface of said ribbon whereby said brush will be rotated, a reciprocatory frame on which said brush is mounted, and means for reciprocating said frame.

7. In a brick-making machine, the combination of means for extruding a ribbon of ceramic material, a conveyer for said ribbon, a rotatable brush having resilient bristles adapted to engage the surface of said ribbon whereby said brush will be rotated, a reciprocatory frame, means for reciprocating said frame, and means for resiliently mounting said brush on said frame.

8. In a brick-making machine, the combination of means for extruding a ribbon of ceramic material, a conveyer for said ribbon, a rotatable brush having resilient bristles adapted to engage the surface of said ribbon whereby said brush will be rotated, a reciprocatory frame, means for reciprocating said frame, means for mounting said brush on said frame to permit the movement of said brush toward and away from said ribbon, and spring means for holding the bristles of said brush in yielding engagement with said ribbon.

9. In a brick-making machine, the combination of means for extruding a ribbon of ceramic material, means for removing a layer of material from the surface of said ribbon, a plurality of rotatable brushes having resilient bristles thereon adapted to engage the surface of said ribbon whereby said brushes will be rotated, a reciprocatory frame, means for reciprocating said frame in the direction of movement of said ribbon, means for mounting said brushes on said frame to permit the movement of said brushes toward and away from the surface of said ribbon, and spring means for holding the bristles of each of said brushes in yielding engagement with the surface of said ribbon.

In witness whereof I hereunto subscribe my name this 22nd day of December, A. D., 1915.

FRANK W. BUTTERWORTH.