J. GREENAWALT.

ROOFING TILE MACHINE.

No. 188,291. Patented March 13, 1877.

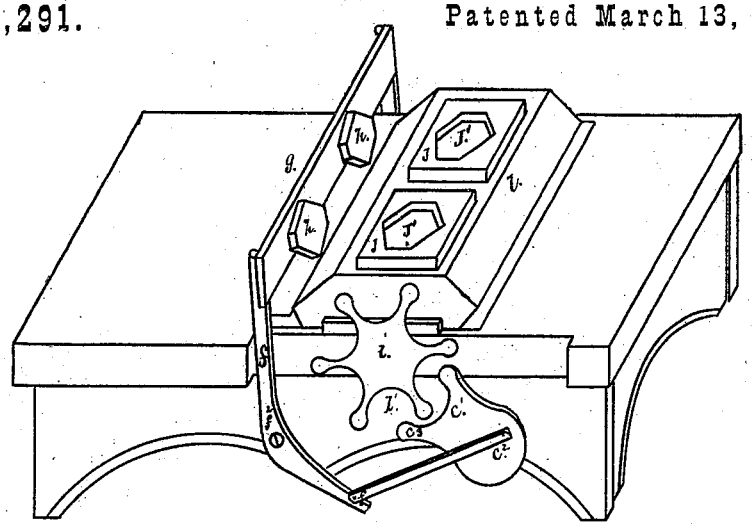

Fig. 1

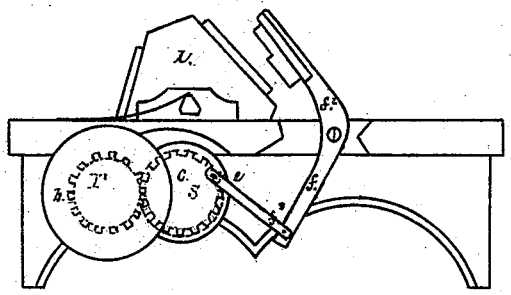

Fig. 2

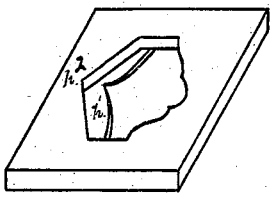

Fig. 4

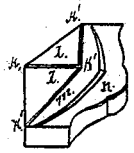

Fig. 5

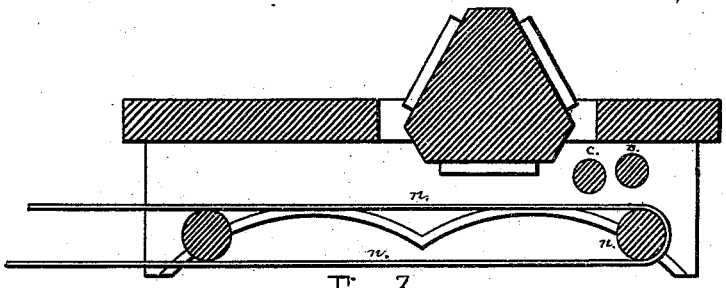

Fig. 3

Witnesses

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UNITED STATES PATENT OFFICE.

JACOB GREENAWALT, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN ROOFING-TILE MACHINES.

Specification forming part of Letters Patent No. **188,291**, dated March 13, 1877; application filed August 5, 1876.

To all whom it may concern:

Be it known that I, JACOB GREENAWALT, of Pittsburg, Pennsylvania, have invented a new and useful Improvement in Roofing-Tile Machinery, which improvement is fully set forth in the following specification, reference being had to the accompanying drawing.

Similar letters of reference indicate corresponding parts.

The object of my invention is the construction and operation of a machine for forming and molding roofing-tile for houses and other buildings; and consists in a system of devices working automatically with each other for the forming of tiles of the desired form, and carrying the same to a kiln for burning.

In order to enable others skilled in the art to which this appertains to make and operate my invention, I will now proceed to describe the same, reference being had to the accompanying drawing, in which—

Figure 1 is a perspective view of my tile-machine. Fig. 2 is a plan view of the reverse side thereof, representing, by dotted lines, the pinion-wheel *r* and cog-wheel S in the rear of the drum *b* and pulley C. Fig. 3 is a vertical longitudinal section. Fig. 4 represents the die for forming the top part of the tile, and Fig. 5 the die for forming the under part of the same.

A represents the frame-work of my machine, constructed of any suitable material. Attached to the frame-work by journals is the driving-shaft B, counter-shaft C′, and cylinder-shaft D. Attached to the shaft B is the driving-pulley *b*. The power is communicated to the machine by a belt from an engine, or other motive power, operating the driving-pulley *b*. Attached also to the shaft B is a cog pinion-wheel, *r*, which engages with the cog-wheel S on the shaft C′, communicating a rotary motion to the shaft C′. Secured to the shaft C′ are the pulleys C and gear-wheel S. By means of the wrists c^2 c^2 and the beams *e e*, a reciprocating motion is communicated to the levers *f f*, the ends of the beams *e e* are attached to the levers *f f* by wrists f^3 f^3. The levers *f f* are suitably pivoted at f^2. Attached to the end of the levers *f* is a suitable frame-work, *g*, to which the plunging part of the dies *k s h h h* is secured. To the shaft D is rigidly secured the triangular-shaped cylinder *i*. Secured to the cylinder *i*, and upon the three sides of the same, are dies for compressing and forming the top part of the tile to the proper shape, and working in conjunction with the plunger part of the dies *h*. The dies J are made of steel or chilled iron of suitable size and shape on the outside surface, to be bolted or secured in proper manner to the cylinder *i*. Openings J′ J′ are made in the top of the dies J J of lozenge or diamond shape, of suitable depth to receive the clay to be formed. The bottom surface of the dies J J is made level, except a sunken groove, h^1, about one-eighth of an inch deep and about one-fourth of an inch wide, of angular shape, and extending from side to side of the die, and near the top h^2 of the same. Working in conjunction with the dies J is the follower or plunger die *h*, operated by the levers *f*. The dies *h* are made of hardened steel or chilled iron, diamond or lozenge shaped, of a suitable thickness, and are secured to the frame-work *g*. The lower surfaces of the dies *h h* form an inclined plane from the point *k* to the points *k′ k′ k′*, of about the depth of three-eighths of an inch below the level of the point *k*. The parts *l l* are sunken in the same direction about one-half the depth of the point *k*. The parts *n* are made level at the same depth of the point *k*. Upon the level part of the part *n* is a raised ridge, *m*, of about one-eighth of an inch high, and of about one-fourth of an inch wide, of angular shape, running from side to side of the die.

The peculiar shape of these dies, ridges, grooves, &c., is necessary in the construction and manufacture of tiles, such as are fully described in my application for a patent on roofing-tiles filed in the United States Patent Office on the 28th day of July, A. D. 1876.

I will now proceed to describe the operation of my machine. When the driving-pulley is set in motion the pinion upon the shaft B of the same engages with the cog-wheel of the shaft C′, imparting a rotary motion to the shaft, which, in turn, imparts a reciprocating motion to the levers *f f* by means of the wrists c^2 c^2, beams *e e*, and wrists $f^3 f^3$, and pivots $f^2 f^2$, and at the same time, by the motion of the shaft C′, the cogs of the wheel *r* engage with the cogs of the wheel S upon the cylinder-shaft *d*, there being six

cogs to the wheel on the cylinder-shaft and two of the same size and within the same space on the wheel *r*. It will be seen that the shaft C′ makes a full revolution, the cylinder *i* will make but one-third of a turn; and also that, the lever *f* being operated by a full turn of the shaft C′, the cylinder is allowed to come at rest at the proper position, while the lever *f* moves up to the same, compressing the dies and molding the tile, allowing the lever to move back out of the way of the cylinder while the same is moved forward for the next operation.

The machine is so adjusted that while one set of tiles is being molded upon one of the three sides of the cylinder, the empty dies are being filled by an endless belt or other suitable mechanism, and the molded tiles are being discharged upon an endless belt, n^3, operated by a pulley, n^2, beneath the frame A, when it is carried to any point desired for burning.

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

1. The cylinder *i*, gear-wheels *r* and S, levers *f*, beams *e*, wrists c^2 and f^3, pivots f^2, and wheel C, substantially as described and shown.

2. The diamond-shaped dies J and *h*, working in conjunction with each other, having the planes inclined from the point *k* to the points *k′ k′ k′*, depressions *l l*, level parts *n*, ridge *m*, and sunken groove h^1, as described and shown substantially, and for the purpose set forth.

3. The combination of the triangular cylinder *i*, dies *h* and J, gear-wheels *r* and S, pulley C, beams *e*, levers *f*, wrists f^3 and c^2, pivots f^2, pulley n^2, and endless belt n^3, all combined and arranged substantially as and for the purpose set forth.

4. In a roofing-tile machine, the diamond-shaped dies, having the bottoms inclined from the point *k* to the points *k′ k′ k′* and level part *n*, for making a tile thinner at its upper edge, and rabbeted at its lower edge, substantially as described and shown.

JACOB GREENAWALT.

Witnesses:

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LIZZIE M. GREENAWALT.