

G. Graessle

Nº 13,059,

Patented June 12, 1855.

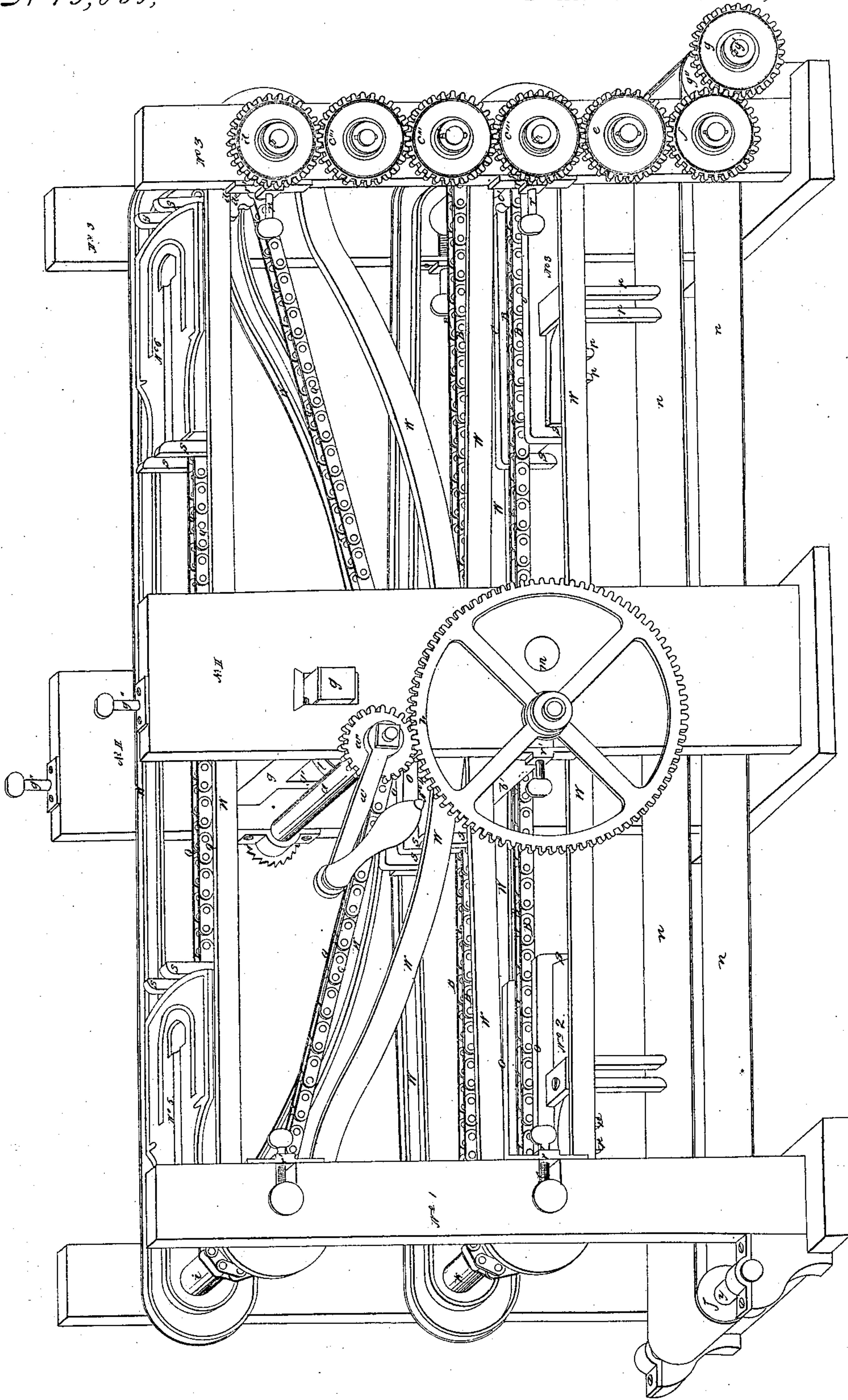


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Tile Machine,

Sheet 2 of 3 Sheets

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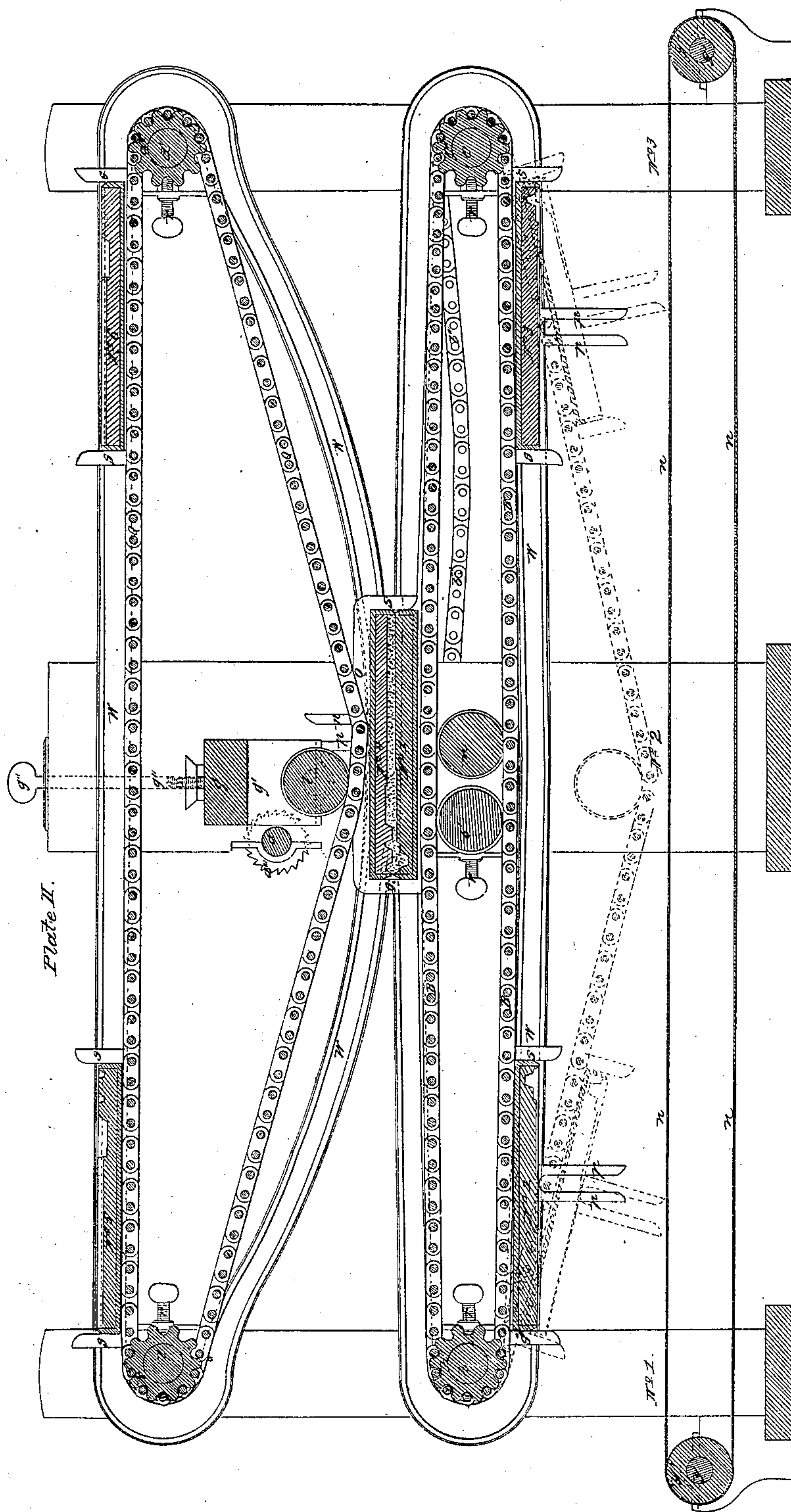
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UNITED STATES PATENT OFFICE.

GOTTLIEB GRAESSLE, OF ROSSVILLE, OHIO.

TILE-MACHINE.

Specification of Letters Patent No. 13,059, dated June 12, 1855.

To all whom it may concern:

Be it known that I, GOTTLIEB GRAESSLE, of Rossville, in the county of Butler and State of Ohio, have invented a new and Improved
5 Machine for Making Tiles, Bricks, &c.; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, and to
10 the letters of reference marked thereon.

Plate 1 is a perspective view of the machine; Plate 2, a longitudinal section; Plate 3, Figure 1, a transverse section, Fig. 2 showing the ready made tiles in their position on
15 the roof of a building, Fig. 3 showing a mold of the underside of the tiles, *a, a*, being the molds for the channels therein, Fig. 4 showing a mold for the upper side of the tiles, *a, a*, being the molds for the ridges of
20 the same, Fig. 5 showing both the molds joined close to each other as in their position under the pressing power of the machine, Fig. 6 showing the upper view of the joined molds, Fig. 7 showing a detail of the ma-
25 chinery providing the regulation of the chains. Fig. 8 is a longitudinal section of Fig. 2, by the line A, B, showing the mode of hanging the tiles on lathing on the roof, Fig. 9 showing the details of a ratchet wheel
30 attached to the machine.

The nature of my invention consists in making the above-mentioned roofing tiles by a pressing machine which will be described in the following specification.

35 To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

The material used for making the above mentioned tiles is common brick-clay, but
40 to be clear of any other substance as, namely, of sand, stones, lime, etc. This clay when ready for use is to be in a state of humidity and stiffness like that used by potters and so that it can be easily handled the clay being
45 thus ready for use is to be put into the corresponding mold of the machine and when well pressed and formed they are to be dried on an airy place and finally set into the kiln and burned therein until they become absolutely
50 hard. The form as well as the construction of the thus ready-made tiles is to be seen on Plate 3, Figs. 2 and 8. The letters *a, a*, show the tiles above and the letters *a' a'* those below for both the figures. The letters
55 *b, b*, show the said ridges of the tiles join-

ing into the said channels of the under- side of the tiles, so as to cover thus the ridges of the upper side of the tile *a'*, (see Figs. 2 and 8, on Plate 3,) not allowing the rain or snow to enter under the tiles. The
60 small cross ridges *c, c*, project something above the surfaces (see Figs. 2 and 3, Pl. 3) of the tiles, and close the mouths of the channels which covers the edge-ridges of two adjoining tiles. (See the red dotted
65 lines on Fig. 2.) The heads *e e* of the molded ridges *d, d*, serve also to keep off the rain and snow from entering under the tiles and the said molded ridges *d* make the water run off from the tiles to both sides
70 of the same, so that it neither can enter into the joints marked *f*. (See Fig. 2.)

Fig. 8 shows a longitudinal section of Fig. 2, by the line A, B, showing fully the form and construction as well as the posi-
75 tion of the tiles when placed on the roof. The tiles are fastened on the laths by means of small heads fitted to their under sides. (See Fig. 8, letters *h, h*, and Fig. 3, letter
80 *h'*, which show the mold of the said head *h*.) The tiles are thus to be placed closely to each other and secure the most perfect tightness to the roof by their proper con-
85 structions, requiring no use of line or any other medium for the immovable connection. Further these tiles allow by their construc-
90 tion above described any pitch to the roof the steepest as well as the flattest, and no gale or any hurricane will have influence regarding to their immovable position and
the tightness of the single joints of the same.

As to the description of the machine there is Plate 1, a general perspective view of the same. There is in it a main frame of
95 wood or of any other convenient material consisting of three main parts No. 1, No. 2, and No. 3, each consisting of two upright pieces strongly framed into a sill. (See the drawing.) There is further an iron shaft *a*,
100 resting with its journals in the two upright pieces of the frame No. 2, and provided on one of the journals with a crank *a'*, to which the small brass wheel *a''* is fastened. On the other journal of this shaft is a ratchet
105 wheel. (See the detail of the same on Plate 3, Fig. 9.) The latter is marked *a'''*. The motion of the machine begins now by turning the crank *a'* in the direction from the right to the left, and is communicated first
110

to the large wheel *b*. The wheel *b* is fastened to one of the journals of the shaft *b'*. (See Plates 1, 2, and Plate 3, Fig. 1.) This shaft *b'* rests with its journal in two upright pieces of the same frame No. 2, and is provided on its other journal with a small wheel *b''*, (see Plate 3, Fig. 1, by means of which wheel *b''* the said motion is communicated to a chain *b'''*. (See Plate 3, Fig. 1, and Plate 2.) The construction of this chain *b'''* is similar to that of chain B, which is fully shown in Figs. 5 and 6 on Plate 3 in the perspective view Plate 1, and in Plate 2 in the longitudinal section. The chain *b'''* (through the medium of a cog wheel not seen) communicates motion to the shaft *c*, resting with the journals in the two upright pieces of the frame No. 3. To the middle of this shaft *c* there is fastened a spur wheel marked *c'* whose cogs gear with a chain marked B. To the other journal of the said shaft there is further a wheel fastened marked *c''*. That wheel on the first mentioned journal of this shaft *c* is not visible on one of the drawings, but it is fully equal in form and size with the wheel *c''*. The motion is communicated now to the said shaft *c*, and thus to the mentioned wheels *c'* and *c''*. The wheel *c''* then communicates the motion by the medium of the wheels *c'''* *c''''* and *d* to the shaft *d'*, which is placed with its journals the same as the shaft *c* in the frame No. 3. The wheel *c''* further communicates the motion by means of the wheels *e*, *f*, and *g* to the shaft *g'* on the same frame No. 3. The wheels *c'''* *c''''* *d* *e* *f* and *g*, being exactly the same size and form thus communicate the same motion to each other as well as to the shafts *d'* and *g'*, making these shafts turn around in the same direction with the original motion of the wheel *a''* from the right to the left. (See Plates 1, 2, and Plate 3, Fig. 1.) The wheel *c'*, fitted to the middle of the shaft *c* communicates the motion by the medium of the said chain R to the opposite shaft *h* and to the wheel *h'* being placed to the middle of this shaft *h*, which is placed with its journals in the two upright pieces of the frame No. 1. With the chain B there are connected three molds marked No. 1, No. 2, and No. 3, which are the molds for the underside of the tiles. These molds are set in motion by means of the said chain B, and move in the same direction with the chain.

The shaft *d'* being in motion by the medium of the wheels *c'''* *c''''* *c''''''* and *d* communicates the motion to the wheel *d''* placed to its middle and by the medium of the chain Q to the opposite shaft *i* and the wheel *h* placed to the middle of the same. (See Plates 1, 2 and Plate 3, Fig. 1.) With the chain Q there are connected three molds marked No. 4, No. 5, and No. 6, which are the molds for the upper side of the tiles.

These molds are set in motion by means of said chain Q moving in the same direction like the chain and the said molds No. 1, No. 2, and No. 3. The wheels *c'*, *d''*, *h'* and *h* fitted to the shafts *c*, *d*, *h* and *i* have exactly the same size and construction, and thus the chains B and G as well as each of the two systems of molds No. 1, No. 2, No. 3, and No. 4, No. 5, No. 6 will move exactly the same regarding to time and direction. There are fitted to the longitudinal sides of each of the said molds small cylinders marked *x*, provided on their end with small movable rollers marked *z*, (see Plate 3, Figs. 1, 3, 4, 5 and 6) and further there are fitted ridges O to the surfaces of the molds, serving for strengthening the same. The ridges are continued around the edges of the smaller ends of the molds, forming thus a sort of hook marked *s*, (see Plate 3, Figs. 1, 3, 4, 5, 6,) and further there are fitted forks *p* to each of the longitudinal sides of the molds for the underside of the tiles one fork to each longitudinal side and corresponding with one of the said cylinders *x* of the molds for the upper side of the tiles. (See Plates 1, 2, and Plate 3, Figs. 1, 3, 4, 5, 6.) There are further iron tracks marked W, attached to the machine of which the transverse section is shown on Plate 3, Fig. 1, and shown further on the Plates 1 and 2. The said molds No. 1, No. 2, No. 3, and No. 4, No. 5, No. 6 are moving along these tracks W by means of the said rollers *z*, fitted on the exterior ends of the cylinders *x*, and drawn by the corresponding chains B or Q, and as they are smaller than the width between the said tracks W, they have sufficient room to make the revolution as described in the following. There is further applied to the machines a pressing power consisting of three iron shafts marked *b*, *l*, and *m* (see Plates 1, 2, and Plate 3, Fig. 1, all of exactly the same diameter.)

The shaft *b'* is mentioned already before, being that shaft to which the large wheel *b*, has been attached and shown fully in Plate 3, Fig. 1. The shaft *m*, resting with its journals in the two upright pieces of the frame No. 2, and being without any other connection with the machine serves only for the pressing power. The upper and third shaft *l* is resting with its journals in a particular frame situated between the upright pieces of the last mentioned frame and is connected with a construction used for regulating the pressing. This construction providing the regulation of the pressing consists of a piece of wood or any other convenient material of a square form in its transverse section and marked *g*. It passes with its ends through both the said upright pieces of the same frame No. 2, projecting somewhat to both the external surfaces of the latter. (See Plate 1 and Plate 3, Fig. 1.)

There are further two pieces marked g' of the same material as the former piece marked g , which are strongly framed by mortises and in a square position to the said piece g , and which serve to carry the said shaft l . With this construction there are further connected two screws g'' , one to each of the ends of the said piece g , and operating thereon and thus moving up or down the whole of the described construction together with the shaft l , and thus enlarging or diminishing the distance between the shaft l and the shafts b' and m and regulating the pressing power. There are further two shafts marked y on behalf of the frame No. 1, and y' on behalf of the frame No. 3, resting with their journals in the upright pieces of each of the corresponding frames. These shafts are provided with rollers g'' and y' and placed as near to the bottom as possible. The shaft, g' having received the motion by the medium of the said wheels c'' , e , f , g , communicates the motion by means of the straps n to the shaft y and the roller y' . The said strap n serves to carry away the ready made tiles as it will be described in the following. There is further a construction regulating the said chains b''' , B , Q , and shown on Plate 3, Fig. 7. r shows a screw. r' is a plate of metal to be fitted to the proper places of the frames No. 1, No. 2, and No. 3. (See Plates 1 and 2.) r'' shows a piece of iron made to the form as shown on said Fig. 7, and connected with the screw r . The journal of the shaft is shown by r''' . This construction being placed on the said places operates as follows to wit: The screws r being turned around in the proper direction moves the pieces r' toward the journal of a corresponding shaft and joins it finally closely to the same thus moving the shaft out of its position and enlarging thus the distance between two corresponding shafts c , h , or d' and by means of this, stretching the corresponding chains; or vice versa, the chains become slackened by turning the screws r in the other direction. These regulating constructions are placed to the small edges of the upright pieces of the frames No. 1, No. 2, No. 3, as it will be seen on the drawings.

The machine being in the described motion operates as follows: The molds No. 1 shown on the planes as being under the press had previously to this situation, the same situations shown by the molds No. 2, No. 3, and these latter molds will follow thus—the same time the mold No. 1, is leaving its said position the molds No. 2 and No. 3 are beginning their motion from the right to the left. The mold No. 2 then arrives the first to the point where the said tracks are forming a half circle turning and are considerably enlarged here. (See Plates

1 and 2.) The mold No. 2 continually drawn by the chain B , then makes the same turning as the said tracks when the mold has made one-fourth of the turning, being then in the position of an angle of 45 degrees is to be supplied with the clay described above. In the mean time the mold No. 2 thus makes the described operation and the mold No. 3 is following the same way the molds No. 5 and No. 6 will operate alike. The molds No. 2 and No. 5 having made the revolution around the corresponding wheels h' and h continue to follow the said tracks W and are moving toward each other. The forks p of the mold No. 2 then catch the cylinders x of the mold No. 5, and thus they become connected to each other until the said hooks s , being fitted to each of the molds, catch the corresponding molds, thus joining the same closely and then the molds enter the press between the said shafts b' , m , and l . The above mentioned ridges O , form on their top edges a curved line, and by this means they receive the strongest pressure on the middle, and thus they answer their purpose to give strength to the molds as well as to distribute the pressure uniformly (see Plate 2, and Plate 3, Fig. 1.) The molds No. 2 and No. 5 then are passing the pressing power and become separated again by means of the iron track W , and are moving from each other in the same time and in the same mode that they have previous to the pressing moved toward each other, and finally they make the above described revolution, following the circle form of the tracks around the wheel d'' of the opposite shaft, d' and the wheel c' of the corresponding shaft c . The mold No. 2 now containing the ready tile makes by its revolution around the last named wheel c' a sort of a drop by falling off from that small bolt by which it has been connected with the chain B . By this dropping the tile becomes loose in the mold and falls out of it and drops down to the strap n . The strap n then carries away the tile. The shaft y , with its roller y' , may be situated in any distance, being in the direction of the motion of the machine and thus the ready made tiles may be carried to the convenient point put up to dry. Thus one mold is following the other making the like way and revolution around the wheels. The iron tracks W for each of the two described systems of molds have no connection with each other and thus the motions of the same are separated. The mentioned strap n may be replaced by small boards connected with each other by small chains. The upper chain (Q) and the lower one (B) are of equal length, but loosely jointed, that they may not oppose by their rigidity the easy mutual action of the forks (p) and the cylindrical

pins (x) and also that free scope may be allowed for the deflection of either chain in the act of pressing the tile. This deflection in my working machine is only slight in
5 comparison with the length of the chain.

The above described machine makes about 10,000 tiles a day including the carrying away of the ready made tiles.

As I have been experimenting by my
10 machine a considerable time I made the following experience: The said molds may be cast in metal and filled out with plaster or they may be made entirely from metal and no lime or plaster be used. In the first
15 mentioned case the plaster is to be moistened with water $\frac{1}{4}$ of an hour previous the use. In the second case, the molds are to be coated inside with ashes, which makes the finished tiles fall easily out of them; and
20 the inside surface of the molds should be

cast somewhat rough to make the ashes adhere.

The dotted lines in the drawing represent a form that the lower chain may be made to assume when stretched to the same length 25 and tension as the upper one. For this purpose an additional roller such as represented by dotted lines may be employed.

I claim as new and of my invention—

The combination of the two endless chains, 30 corresponding molds and pressure rollers, formed and constructed substantially as described.

In testimony whereof, I hereunto set my hand before two subscribing witnesses.

GOTTLIEB GRAESSLE.

Witnesses:

R. HARGITT,
EVAN DAVIES.