April 11, 1944. E. A. RENDER 2,346,393

ADJUSTABLE DIE FOR FORMING CURVED BRICKS

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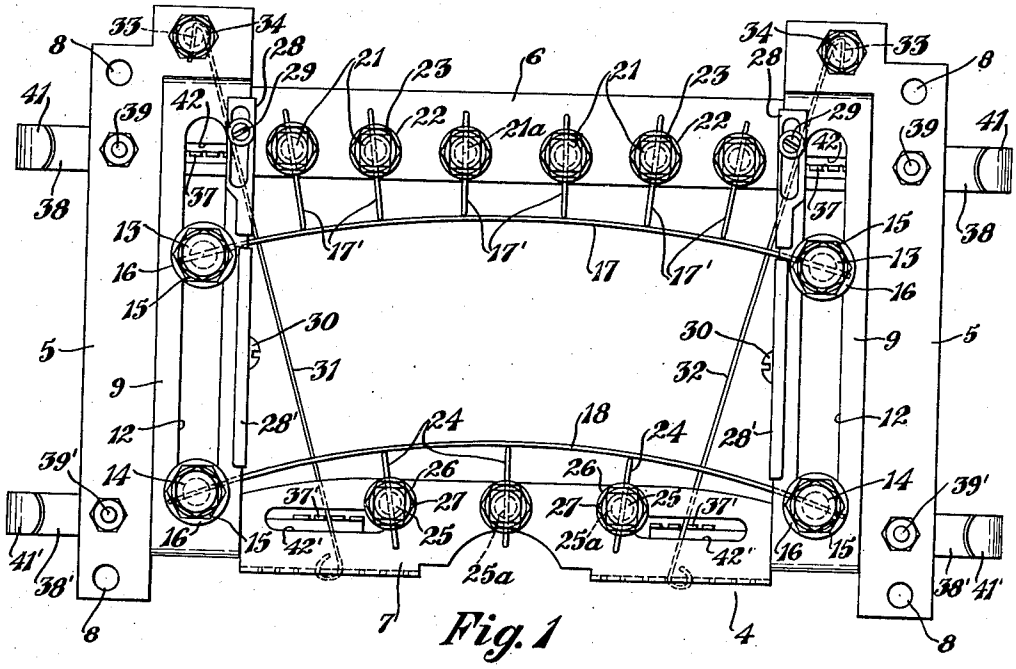


Fig. 1

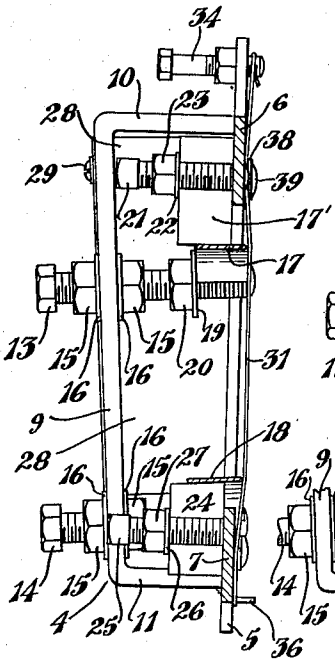


Fig. 3



Fig. 4

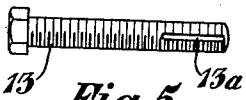


Fig. 5

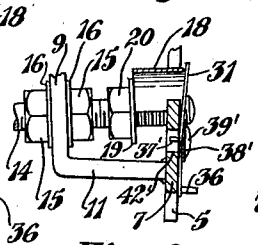


Fig. 6

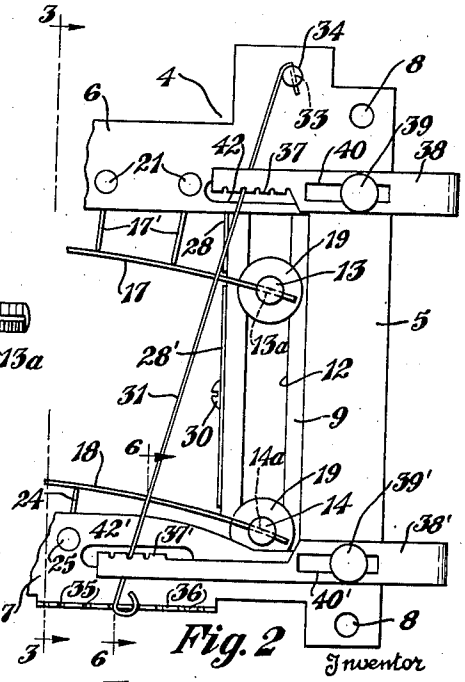


Fig. 2

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ADJUSTABLE DIE FOR FORMING CURVED BRICKS

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2 Claims. (Cl. 25—112)

The invention relates generally to forming bricks by auger machines in which a column of clay is forced through a rectangular die, and the column is then cut into individual bricks. More particularly, the invention relates to an adjustable die for attachment to an auger machine to form curved bricks having a variety of shapes.

In making curved or arcuate bricks, it is usual practice to attach a die plate having the desired curvature to the exit end of the auger machine. However, starter or end bricks which have the same curvature on one end and the other end straight are also required, and these necessitate a separate die plate. Moreover, curved bricks are required with varying degrees of curvature, and each particular size brick and each particular degree of curvature requires a separate die plate.

The use of an individual die plate for each size and each differently curved brick involves much delay in having die plates made to suit special requirements, and also involves excessive expense.

Accordingly, it is an object of the present invention to provide a novel and improved die for forming curved bricks, which die is adjustable for a variety of degrees of curvature.

Another object is to provide a novel and improved die for forming curved bricks of different sizes.

A further object is to provide a novel and improved die for forming curved bricks, which die is easily attached to the exit end of the conventional auger machine.

Another object is to provide a novel and improved die which can be adjusted to form arcuate bricks and starter bricks having the same curvature at one end only.

A further object is to provide a novel and improved die for forming curved bricks and having adjustable means for forming the ends of the bricks flat substantially on the planes of radii of the curved sides thereof.

A still further object is to provide a simple and inexpensive die for forming curved bricks, which can be quickly adjusted with ordinary tools.

These and other objects are accomplished by the improvements comprising the present invention which may be stated in general terms as including a rectangular frame adapted for attachment to the exit end of the auger machine, vertically spaced curved knives adjustably mounted in the frame for forming curved concentric upper and lower surfaces of varying degrees of curvature on the clay column issuing from the auger machine, and laterally spaced cutting wires adjustably mounted in said frame for forming flat side surfaces on the clay column.

Referring to the drawing forming part hereof,

Figure 1 is a front elevation of the improved adjustable die for forming curved bricks;

Fig. 2 is a fragmentary rear elevation thereof;

Fig. 3 is a sectional view as on line 3—3, Fig. 2;

Fig. 4 is a detached elevation of one of the bolts for adjustably securing the plates abutting the curved knives;

Fig. 5 is a detached view of one of the bolts adjustably securing the ends of the curved knives; and

Fig. 6 is a fragmentary sectional view as on line 6—6, Fig. 2.

Similar numerals refer to similar parts throughout the several views of the drawing.

The improved die includes a frame indicated generally at 4 having side members 5 and top and bottom cross members 6 and 7 respectively. The four corners of the frame are provided with bolt holes 8 for receiving suitable bolts to attach the die to the exit end of a conventional auger machine, so that the clay column issuing from the auger machine passes through the rectangular opening formed by the frame 4.

At each side of the frame, a U-shaped supporting bar 9 is provided and the bars 9 have inwardly extending legs 10 and 11 which are attached at their ends to the cross members 6 and 7 of the frame as by welding. The supporting bars 9 are provided with vertically extending slots 12, and vertically spaced bolts 13 and 14 extend through the slots and are vertically adjustably secured to the bars 9 by means of lock nuts 15 and washers 16. The inner ends of the bolts 13 and 14 are longitudinally slotted at 13a and 14a respectively, for receiving the ends of concentrically curved knife blades 17 and 18 respectively, extending laterally across the frame, the upper knife blade 17 having its ends extending through the slots 13a, and the lower knife blade 18 having its ends extending through the slots 14a.

In order to clamp the ends of the knife blades in the slots 13a and 14a of the bolts 13 and 14, the rear edges of the knife blades are abutted by washers 19 backed up by lock nuts 20 screwed on the bolts 13 and 14 respectively. The means for adjusting the curvature of the upper knife blade 17 and for maintaining the knife blade in a desired curve to form a convex upper surface on the clay column, preferably includes a series of laterally spaced blades 17' having their lower ends abutting the upper convex surface of the knife blade 17 and secured at their upper portions by means of bolts 21 which are screwed into the upper cross member 6 of the frame. The blades 17' pass through slots 21a in the bolts 21 and are rigidly held therein by means of washers 22 abutting the rear edges of the

blades 17' and backed up by lock nuts 23 screwed on the bolts. Thus by loosening the lock nuts 23, the blades 17' can be slid up or down to accommodate different degrees of curvature of the knife blade 17.

Similarly, the lower knife blade 18 is adjusted to different degrees of curvature and maintained in a desired curve to form a concave lower surface on the clay column, by means of laterally spaced blades 24 having their upper ends abutting the lower concave surface of the knife blade 18. The blades 24 pass through slots 25a in bolts 25 which are screwed into the lower cross member 7, and are held in adjusted position by means of washers 26 backed up by lock nuts 27 on the bolts 14.

The bolts 13 and 14 can be adjusted vertically up or down in the slots 12 by manipulating the lock nuts 15, so as to accommodate a range of sizes of circular bricks, and the blades 17' and 24 can be adjusted up or down to vary the degree of curvature of the knife blades 17 and 18 for the several sizes of bricks.

Preferably the bars 9 have baffles 28 and 28' arranged along their inner sides to prevent the clay passing through the improved die from moving laterally outward and clogging around the bolts 13 and 14. The upper baffles 28 are located above the knife blade 17 and are preferably bent around and secured to the tops of bars 9 by screws 29, and the baffles 28' are located between the knife blades 17 and 18 and are secured to the inside edges of the bars 9 by screws 30.

For forming flat sides on the clay column as it passes between the curved knives 17 and 18, laterally spaced cutting wires 31 and 32 are provided. These wires extend downwardly across the rear edges of the curved knives 17 and 18 along lines substantially coinciding with the radii of curvature of the curved knives 17 and 18. The upper ends of the wires are secured in holes 33 in the inner ends of bolts 34 which are screwed in the upper corners of the frame 4, and the lower ends of the wires are secured in notches 35 formed between inturned teeth 36 provided on the lower edge of the bottom cross member 7 of the frame.

Between the bolts 34 and the upper curved knife 17, the wires 31 and 32 pass between outturned teeth 37 provided on laterally slidable adjusting bars 38 which are adjustably secured to the side bars 5 of the frame by means of bolts 39 passing through slots 40 in the bars 38. The outer ends of the bars 38 are provided with curved finger grip portions 41, and the outturned teeth 37 project into laterally extending slots 42 in the upper cross bar 6 of the frame.

Similarly, the portions of the wires 31 and 32 extending between the teeth 36 on the lower edge of the frame and the lower curved knife 18 pass between outturned teeth 37' on the inner ends of laterally adjustable bars 38' which are adjustably secured to the side frame members 5 by bolts 39' passing through slots 40' in the bars 38'. The outer ends of the bars 38' are provided with curved finger grip portions 41' and the teeth 37' provided at their inner ends project into laterally extending slots 42' in the bottom cross member 7 of the frame.

Thus the angularity of the wires 31 and 32 can be changed by changing the lower ends of the wires from one to another of the notches 35, and a fine adjustment of the angularity of the wires can be made by loosening the bolts 39 and 39' and laterally shifting the adjusting bars 38 and 38'.

In the operation of the improved die, a pattern of the cross sectional shape of curved brick desired is first made, and the knives 17 and 18 and wires 31 and 32 adjusted to accurately fit the pattern. Then, with the die secured to the exit end of an auger machine by bolts extending through the holes 8 in the frame 4, the clay column issuing from the auger machine will pass through the die and be formed into the arcuate or curved column defined by the upper and lower curved knives 17 and 18 and the side cutting wires 31 and 32, after which the column is severed into bricks in a usual manner.

It is obvious that by adjusting the bolts 13 and 14 up and down in the slots 12, a considerable range of sizes of curved bricks can be accommodated, and by adjusting the individual blades 17' and 24, the curvature of the knives can be adjusted to produce a great number of variations of curved brick.

Also, a starter brick having one-half straight and one-half curved can be formed, by adjusting the bolts 13 and 14 at one side of the die and the blades 17' and 24 adjacent that side so as to position one-half portion of each of the normally curved knives on a straight line while maintaining the other half portion on a desired curve.

The novel and improved die provides means easily attached to an auger machine for forming a variety of sizes and degrees of curvature of curved bricks, without necessitating a separate die plate for each size and curve, and accordingly greatly reduces the time and expense required in producing curved bricks. Moreover, the improved die is easily adjusted for various sizes and shapes of curved bricks by using ordinary tools.

I claim:

1. Die construction for forming curved bricks including a rectangular frame adapted for attachment to the exit end of an auger machine, vertically spaced curved knives extending laterally across the frame for forming curved upper and lower surfaces on the clay column issuing from the auger machine, means on the frame for adjusting the degrees of curvature of said knives, means securing the ends of said knives to the sides of the frame for lengthwise adjustment of the knives, and said securing means being vertically adjustable on said frame, whereby the knives can be adjusted toward and away from each other and the degree of curvature of each knife is independently adjustable.

2. Die construction for forming curved bricks including a rectangular frame adapted for attachment to the discharge end of an auger machine, vertically spaced curved knives extending laterally across the frame for forming concentrically curved surfaces on opposite sides of the clay column being discharged, adjustable means on the frame for abutting the curved knives at intervals intermediate their ends, bolts adjustably securing the ends of said knives for lengthwise adjustment therein, and means adjustably securing said bolts to the frame for vertical adjustment thereon.

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