J. R. DAWKINS & D. PARKS.

BRICKMAKING MACHINE.

APPLICATION FILED JAN. 3, 1910.

1,024,122.

Patented Apr. 23, 1912.

3 SHEETS—SHEET 1.

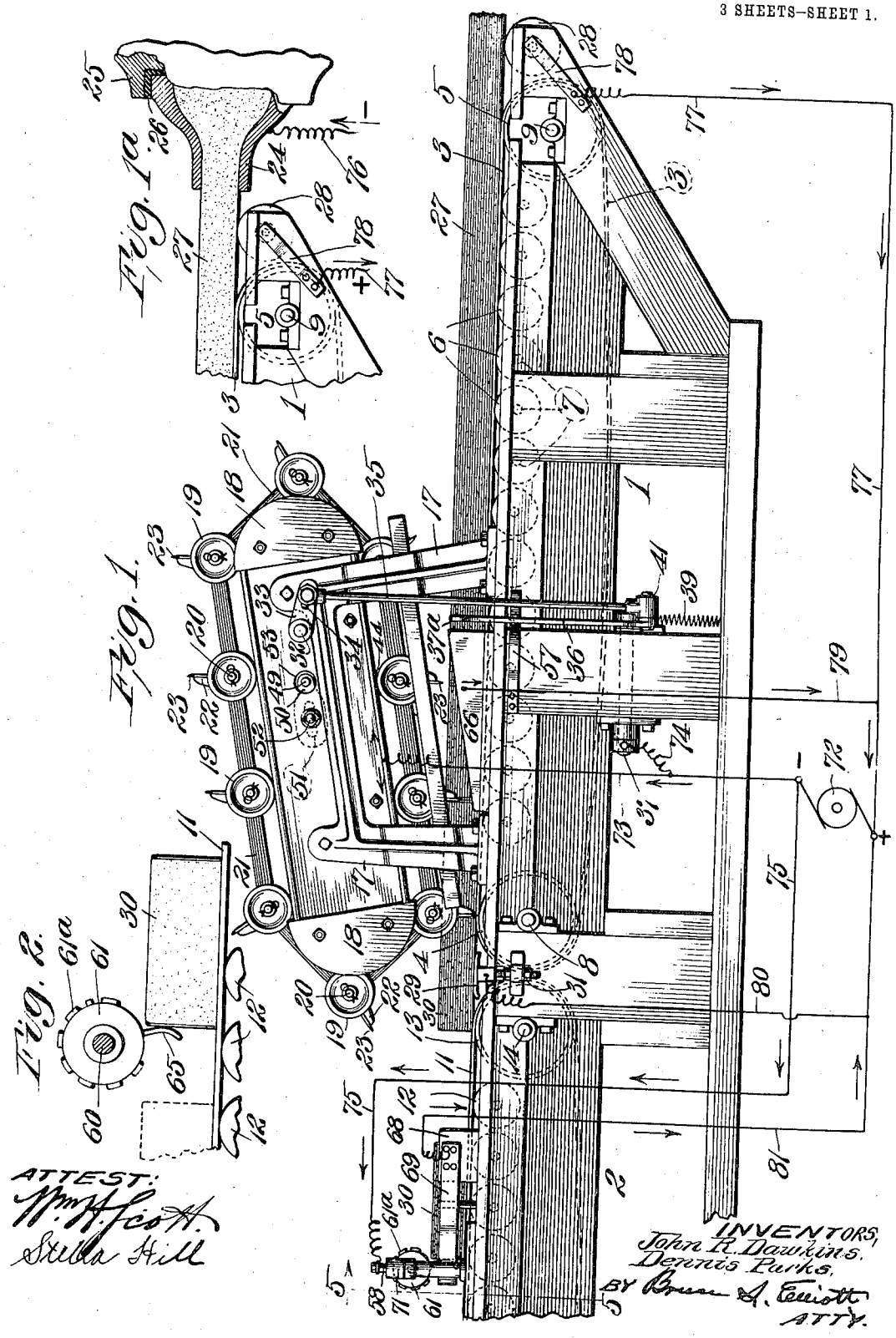

Fig. 1a

Fig. 1.

Fig. 2.

ATTEST:

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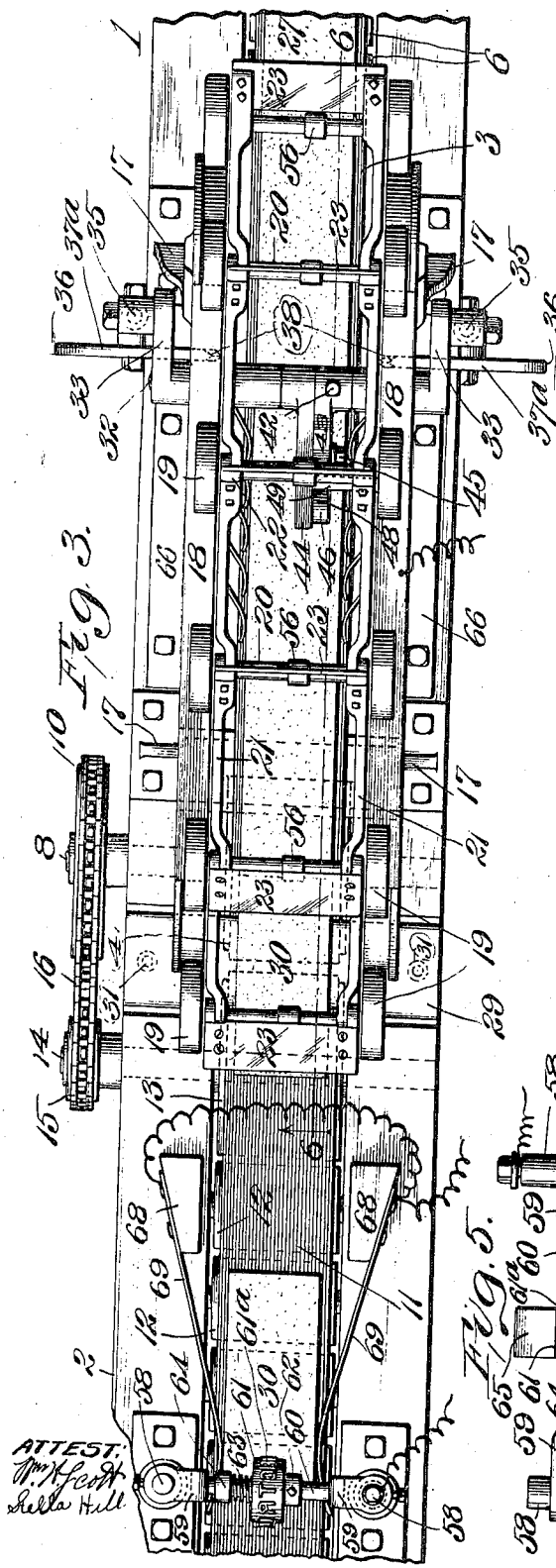

Fig. 3.

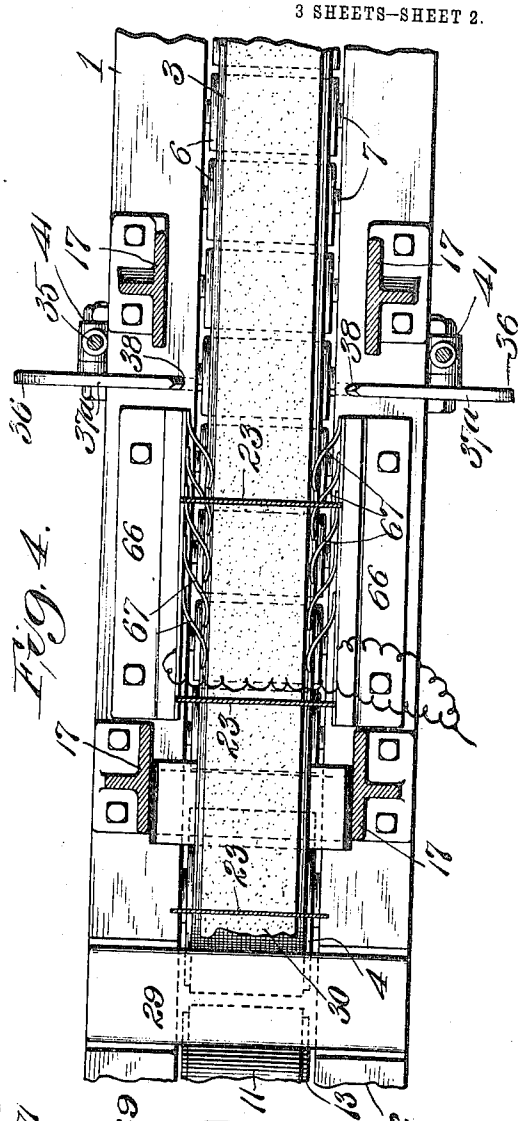

Fig. 4.

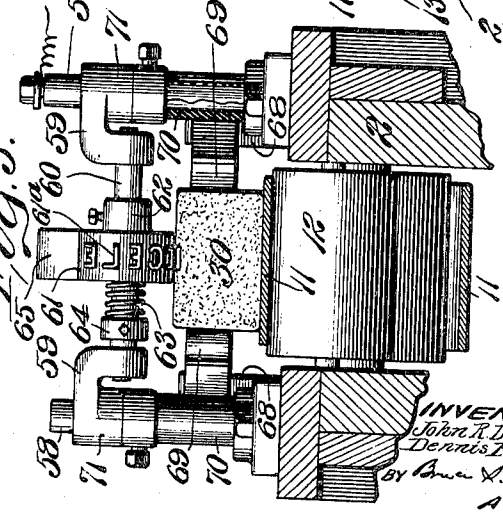

Fig. 5.

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3 SHEETS—SHEET 3.

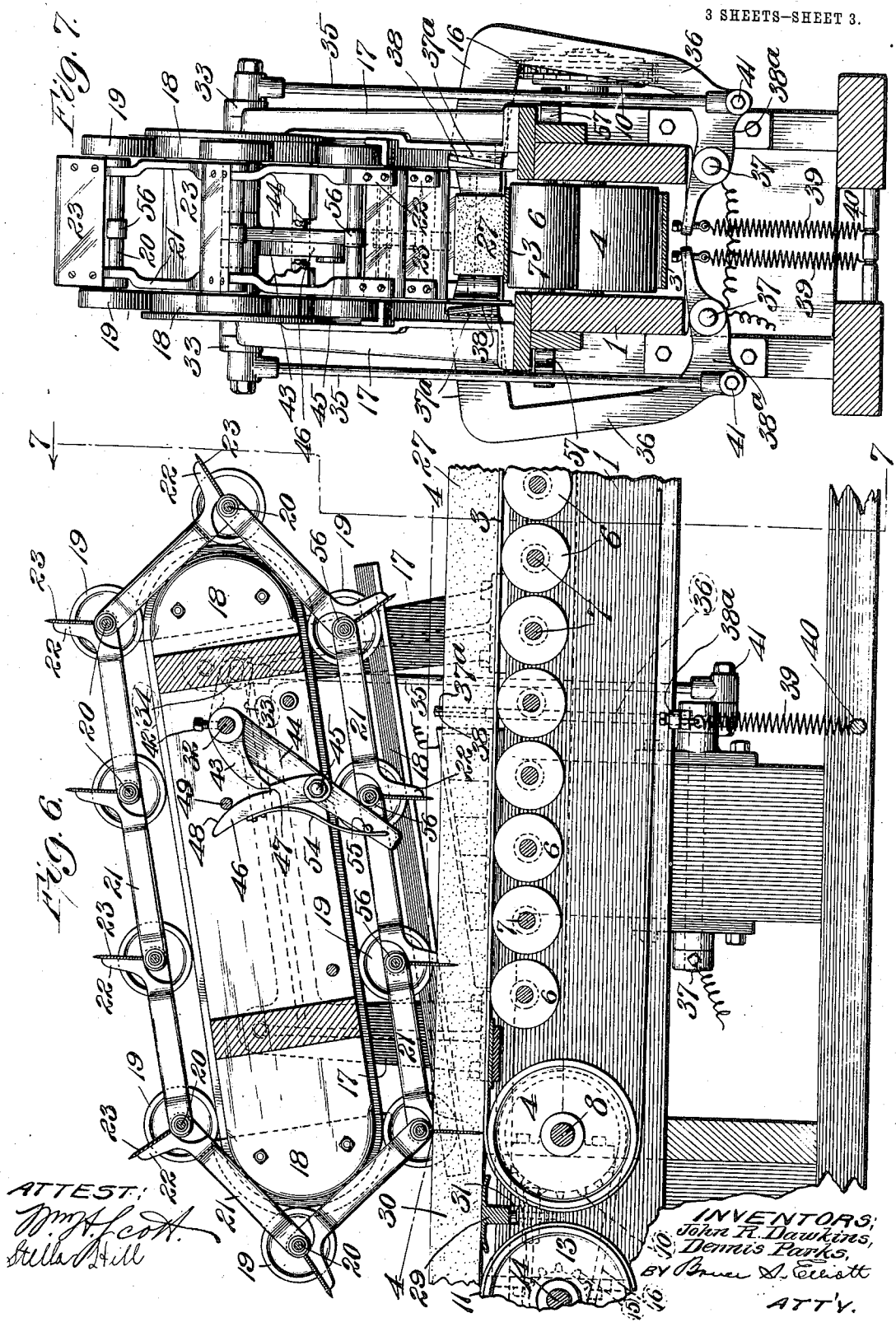

Fig. 7.

Fig. 6.

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UNITED STATES PATENT OFFICE.

JOHN R. DAWKINS AND DENNIS PARKS, OF ST. LOUIS, MISSOURI; SAID PARKS ASSIGNOR TO SAID DAWKINS.

BRICKMAKING-MACHINE.

1,024,122. Specification of Letters Patent. Patented Apr. 23, 1912.

Application filed January 3, 1910. Serial No. 536,101.

To all whom it may concern:

Be it known that we, JOHN R. DAWKINS and DENNIS PARKS, citizens of the United States, residing in the city of St. Louis and State of Missouri, have invented new and useful Improvements in Brickmaking-Machines, of which the following is a specification.

This invention relates to certain new and useful improvements in brick making machines of the type in which clay, suitably prepared, is forced in a continuous column from a container having a rectangular outlet, by means of an auger.

The invention comprises two salient features, viz., the application of electricity to facilitate the free passage of the column of clay from the auger machine, its subsequent indentation and severance into sections of brick length, and the impressing in each brick of a given mark or word; and novel mechanisms whereby the various objects described are attained. Chief among these may be mentioned a novel construction of cutting device, which is operated by the moving column of clay, said cutting device comprising a number of blades mounted on an endless carrier, which blades, in operation, penetrate the column of clay at right angles to its line of movement, and, as stated, sever portions therefrom of the length of a brick. In this operation the clay is prevented from sticking to the knives by the application of electricity, as previously mentioned, and hence it is that we are enabled to use blades, which insure a straight, smooth cut, as distinguished from the employment of wires, which are now universally employed for this operation.

As regards the broad idea of the application of electricity to movable objects to prevent clay from sticking to them, the present invention is an application of the generic idea, in this regard, described and claimed in Reissue Letters-Patent No. 12,715, granted November 5th, 1907, to John R. Dawkins, one of the applicants herein. The application of this discovery to the purposes of a brick making machine, however, presents certain specific and important advantages, due to the nature of the work of such machine, which has heretofore imposed certain limitations upon its improvement. Among these important advantages may be mentioned the fact that in the case of a brick making machine of the auger type, to which the present invention relates, the clay can be utilized in a more moist condition than would be possible without the employment of electricity; and such use of moist clay enables us to make a brick, the body of which is more homogeneous in its structure, by reason of the particles adhering and cohering to a far greater degree than would be possible with the clay in a drier condition. Without the employment of electricity, such moist clay as we are enabled to use would adhere to the walls of the die or mouth of the auger machine, and to other parts of the machine with which it would come in contact in the course of being shaped into bricks. Another of the advantages referred to is that we are enabled to make bricks without the necessity of passing them through a repress after the cutting operation. This advantage we secure by the combined operations of electricity and the novel form of cutter referred to, the former insuring a perfectly smooth surface to the four sides of the column of clay, and the cutters, also aided by the electrical action, operating to sever each brick from the column of clay by means of a straight, smooth cut, thus avoiding jagged and irregular surfaces, so that the brick, when severed from the moving column of clay, and, if desired, impressed with a suitable name or mark, may at once be conveyed to the drying kiln.

The use of blades on an endless carrier possesses the further advantage that we are enabled thereby to run the cutting device directly from the column of clay, by impact and contact of the clay with the broad surfaces afforded by said blades, thus dispensing with intermediate gearing between the belt moved by the clay and the cutting device. This arrangement insures that the cutting device shall act in unison with the belt carrying the clay, and produces an absolute uniform cut irrespective of the rate of speed, or of variations in the speed, of the belt.

In coöperation with the cutting mecha-

nism we have devised an automatic creaser, which operates to indent the clay on opposite sides in the line of the cut of the knives, so that the brick will have beveled side edges. This creasing of the column of clay prior to the cutting thereof also tends to prevent the clay at the end edges of the bricks from being torn off by the descent of the knives through the column of clay.

In addition to the broad features characterizing our machine, there are certain features of novelty residing in details of construction and in the combination and cooperation of the parts described, which will be more fully understood from the detailed description of the invention following.

In the accompanying drawings illustrating the invention, Figure 1 is a view in side elevation, partly broken away, illustrating the main features of our invention; Fig. 1ª is a vertical sectional view of the mouth or die of an auger machine, a portion of the receiving table being shown in elevation, the figure representing, in effect, a continuation of the right hand side of Fig. 1; Fig. 2 is a detached view illustrating the marking device in elevation, its shaft being shown in section; Fig. 3 is a plan view on an enlarged scale of the portion of the machine shown in Fig. 1; Fig. 4 is a horizontal sectional view taken on the line 4—4 of Fig. 6; Fig. 5 is an enlarged section through a part of the frame of the machine taken on the line 5—5 of Fig. 1, and viewed in the direction of the arrow, said view illustrating the marking device and parts immediately coöperating therewith in front elevation; Fig. 6 is a transverse vertical sectional view taken on the line 6—6 of Fig. 3; and Fig. 7 is a cross sectional view taken on the line 7—7 of Fig. 6, and viewed in the direction of the arrow.

Referring now to the drawings, 1 indicates a table for receiving and supporting the column of clay as it issues from the auger machine, and 2 a table for receiving and delivering the bricks as they are respectively cut from the continuous column of clay on table 1. For the purpose of briefness in description we will herein refer to table 1 as the receiving table and table 2 as the delivery table.

The receiving table comprises suitable frame work and standards, which need not be particularly described, and its upper surface is formed by a belt 3 which passes over pulleys 4, 5, located, respectively, at opposite ends of the table, and is supported in a horizontal plane by a series of rollers 6, loosely mounted on shafts 7, which in turn, are journaled at their ends in the sides of the table. The pulleys 4, 5 are mounted on shafts 8, 9, which are journaled in the suitable bearings at the sides of the table. The pulley 4 is fast on its shaft 8, and the latter projects beyond the table at one side thereof. Mounted on such projecting end of this shaft is a relatively large sprocket wheel 10. The upper surface of the delivery table is likewise formed by an endless belt 11, supported to run in a horizontal plane on rollers 12, whose shafts are journaled in the sides of said table, the belt being supported at opposite ends thereof by means of pulleys, only one of which, indicated by 13, is shown. The said pulley 13 is fast on a shaft 14 which is journaled in opposite sides of the delivery table and projects beyond one side thereof, as shown in Fig. 3. Mounted on the projecting end of the shaft 14 is a sprocket wheel 15, of relatively small diameter as compared with the sprocket wheel 10. The sprocket wheels 10 and 15 are fast on their respective shafts and are connected by means of a sprocket chain 16. By the provision of the mechanism described the belt 11 will be moved by and in unison with the movement of the belt 3, but at a higher rate of speed, owing to the difference in size of the sprocket wheels 10 and 15. Mounted on opposite sides of the receiving table, and projecting upward therefrom, are supports 17, on and between which is mounted an inclined run-way 18, the highest end of said run-way being toward the auger machine. Mounted to roll smoothly and easily around said run-way are a series of pairs of rollers 19, each pair of rollers being loosely mounted on opposite ends of a shaft 20. The various shafts 20 are connected in pairs by two links 21, each of said links having at one end a projection 22 inclined slightly from the vertical. Extending between and secured to the projections 22 of each pair of links is a blade 23. The incline of these blades 23 is such that in their movement along the under side of the run-way said blades assume a position exactly at right angles to the plane of movement of the belt 3, as clearly shown in Fig. 6. The links 21 loosely receive the respective shafts 20 at their opposite ends, and as the rollers 19 are loosely mounted on these shafts, the frictional resistance interposed to the rotation of the rollers 19 is very little, and the endless cutting member as a whole can be caused to freely travel about the run-way, with the expenditure of but a slight amount of power. Referring to Fig. 1ª, the numeral 24 indicates the die of the auger machine, a portion of which is indicated at 25, the said die being insulated from contact with the body of the auger machine by insulation 26. As the column of clay 27 passes from the die 24 in the well known manner it is supported and held in a horizontal position by a roller 28, or other character of support, mounted at the end of the receiving table, and passes on to the belt 3. The column of clay will frictionally engage the belt and cause the latter to move

with it. As this movement continues the end of the column of clay will strike against one or the other of the knives 23 and force it along in the same direction, thus rotating the endless cutter. As will be seen, the under side of the cutter moves necessarily in the same direction as the column of clay, and owing to the incline of the run-way, the blades 23 will successively be forced into and gradually through the clay, the cutting being completed when the blade comes in contact with the belt 3, at which point the rollers of that particular blade will move upward by reason of the rollers passing around the lower end of the run-way.

29 indicates a support which is mounted between the pulleys 4 and 13, that is to say, between the ends of the receiving and delivery tables, for supporting the brick 30 in its passage from the belt 3 to the belt 11. As shown, the support 29 is in the shape of a slightly curved plate which is adjustably mounted at opposite ends on the sides of the table as indicated in Fig. 1 at 31. We do not wish, however, to be limited to this particular form of support. In order to make a clean cut of the bricks at the outer edges, and to have the end edges of the brick slightly beveled, we provide an automatic creaser which will now be described.

Extending between and through the sides of the run-way 18, and suitably journaled therein, is a shaft 32, on each projecting end of which is a crank arm 33, in the outer end of each of which is a slot 34, as indicated by dotted lines in Fig. 6. A rod 35 has a connection at its upper end with each of the crank-arms 33 by means of a suitable pin or bolt passed through the upper end of said rod and engaging in the slot 34.

36 indicates a pair of creaser-arms located respectively on opposite sides of the table and pivotally mounted thereon, as indicated at 37. Each of these creaser-arms is bent at right angles to itself at each end, as shown, the upper bent end 37^a of each arm extending part way across the receiving table, and having its forward edge beveled, as indicated at 38. The lower bent ends 38^a project beneath the table and beyond the point of pivotal connection 37. Each of these lower bent portions 38^a has secured to its inner end one end of a spiral spring 39, the other of which is secured on a bar 40, or other fixed part of the table, at the bottom thereof. Each of the rods 35 is pivotally connected to the corresponding creaser-arm 36, as indicated at 41, at a point some distance removed from the pivotal connection 37, and on the side opposite to that to which the spiral spring 39 is connected. Secured centrally of the shaft 32 by means of a set-screw 42 is a dog 43. Loosely mounted at one end on the shaft 32 adjacent to said dog is an arm 44, the lower end of which projects downward below the plane of the path followed by the shafts 20 of the cutter as they pass along the under side of the run-way. Pivotally mounted at its lower end on the arm 44, as indicated at 45, is a pawl 46 which is provided on one side with a shoulder 47 adapted to engage the end of the dog 43. Above this shoulder 47 the pawl 46 is provided with a curved edge 48 which normally bears against a pin 49 adjustably mounted in one side of the run-way. This pin 49 is mounted in the end of a plate 50 (see Fig. 1) which is provided with a slot 51, and is held in position by a suitable nut and bolt 52. An opening 53 is provided in the side of the run-way whereby the attendant can, by striking the arm 50 or the pin 49 therein, vary the position of the latter with respect to the pawl 46. Secured at its upper end to the under side of the pawl 46 is a leaf-spring 54, the lower free end of which bears against a pin 55 carried by the arm 44. Mounted centrally of each of the shafts 20 is a roller 56, and as the endless cutter travels around the run-way these rollers in turn come in contact with the under side of the arm 44 and raise it. This raises the pawl 46 and by the engagement of the shoulder 47 thereof with the dog 43 causes the shaft 32 to be rocked, which throws the outer ends of the crank-arm 33, and consequently the rods 35, downward. This operation causes the upper ends of the creaser-arms to be moved outward against the resistance of the springs 39. As the pawl 46 is moved upward it is gradually moved also backward by reason of the contact of its curved edge 48 with the pin 49 and this continues until its shoulder 47 is moved out of contact with the dog 43, thus releasing said dog and allowing the springs 39 to pull the lower bent ends of the creaser-arms downward. This operates to throw the upper bent ends inward with sufficient force to cause the beveled ends 38 thereof to strike the sides of the column of clay 27 and form a vertical identation therein. As the roller 56 passes from under the arm 44 the latter falls, the leaf-spring 54 pressing the pawl 46 constantly against the pin 49 and in position to have its shoulder 47 engage the end of the dog 43 when the next roller 56 strikes the lower end of the arm 44 and raises the same.

Mounted at each side of the receiving table is a leaf-spring 57, the free ends of which are engaged and pressed inward by the creaser-arms 36 as their upper ends are suddenly thrown inward by the action of the spring 39. These springs 57 act as a cushion for the said creasers, and also to immediately force the creasers outward after their ends have indented the sides of the column of clay. The operation, therefore, is that of a quick, sharp blow of the ends of the creasers

on the sides of the column of clay, the onward movement of the said column not being thereby impeded and the indentation being clearly and evenly impressed. By manipulating the pin 49 through the opening 53 the distance the dog 43 will be raised before the shoulder of the pawl 46 passes out of engagement therewith to allow the creasers 36 to be thrown inward by the springs 39, is so regulated that the indentation in the sides of the column of clay will be made to exactly coincide with the plane of movement of the cutters or knives 23 as they force their way through the column of clay.

As each brick 30 is severed from the moving column of clay the movement of the cutter 23 at its rear end forces said brick over the support 29 until its forward end is well on to the rapidly moving belt 11. Mounted on opposite sides of the delivery table 2 are posts 58, on each of which is mounted a bracket 59 affording bearings for opposite ends of a horizontal shaft 60. Loosely mounted on the shaft 60 is a marking roller 61, having, preferably raised, suitable marks or letters 61^a thereon to be impressed into the top of the brick to serve as a trade-mark or trade-name for the brick. The word shown in the drawing is "Electric." The roller 61 is in contact on one side with a collar 62 secured on the shaft 60, and at its other side with a tension spring 63 coiled around the shaft 60 and held to bear with greater or less force against the roller 61 by means of an adjustable collar 64 mounted on the shaft 60. Projecting from the periphery of the roller 61 is an arm 65 which is adapted to be engaged by the forward end of each brick as it is carried under the roller by the belt 11, to cause said roller to revolve on its shaft until the first of the raised letters 61^a indent themselves in the brick when the roller 61 will be continued to be revolved by engagement of the brick with said letters. The diameter of the roller 61 is such that as the brick passes from under the roller the arm 65 will have been turned into position to be engaged by the forward end of the succeeding brick, when the preceding operation will be repeated. The spring 63 bears with sufficient force upon the roller to prevent its movement after the brick has passed from under it, so that the arm 65 will always be left in the proper position for engagement by the succeeding brick.

We will now describe the electrical connections and arrangements whereby, utilizing the principle of the patent to Dawkins before mentioned, we prevent the adherence of the clay to the various metallic parts of the machinery with which it comes in contact.

Referring to Fig. 4, 66 indicates angle-iron plates secured on the opposite sides of the receiving table, about mid-way of the length of the cutting device, on the side of each of which plates facing inward there are secured a number of flexible strips of metal 67 having free ends extending inward and positioned to bear lightly against the respective sides of the column of clay as it passes under the cutting mechanism.

Referring to Fig. 3, blocks 68 are mounted on opposite sides of the delivery table to which blocks are secured spring-arms 69 having curved ends projecting under the shaft 60 and adapted to bear lightly against the opposite sides of the brick as it passes under the marking roller 61. The said marking roller is insulated from the machine by means of a sleeve of insulating material 70 which encircles the posts 58 and extends between said posts and the hubs 71 of the brackets 59.

Referring now to Fig. 1, 72 indicates, diagrammatically, an electric generator, from the negative side of which a wire 73 leads to, and is electrically connected with, the metallic frame or run-way 18 of the cutting device. A branch wire 74 leads from the wire 73 to, and is electrically connected with, the pivot or spindle 37 of one of the creaser-arms 36. A wire 74^a connects the two spindles 37. A branch wire 75 also leads from the negative side of the generator, and is electrically connected to one of the posts 58 supporting the marking wheel 61. A further branch wire 76, shown detached in Fig. 1^a, leads from the negative side of the generator, and is electrically connected to the die 24 of the auger machine. From the positive side of the generator a wire 77 leads to, and is electrically connected with, the metal roller 28, this being effected, as shown, by connecting wire 77 to an arm 78 which is in contact with the bearing of said metallic roller 28. A branch wire 79 connects the positive of the generator with the plates 66 carrying the brushes 67. Another wire 80 connects the positive of the generator with the support 29, and a wire 81 leads from the positive of the generator and is connected to the two brushes 69. By means of these various electrical connections the following results are secured: (*a.*) The column of clay, in a more moist condition than has heretofore been found practicable, passes freely out from the die 24 without adhering to the die, and having its sides and edges perfectly smooth and regular. (*b.*) The various cutters 23 are successively passed through the column of clay to sever the same into brick lengths, making an even, smooth cut, and are as readily withdrawn from the clay, being entirely free from adhering material. (*c.*)

The marking roller will make a clear-cut impression of its mark on the surface of the brick without the clay adhering to the wheel.

The principle involved in the application of electricity to prevent the adherence of clay to a metal object brought in contact therewith is fully set forth, so far as the same is known, in the said re-issue patent to Dawkins, referred to above; in order to make a complete description of the present invention, it may be well to state, briefly that such principle consists in connecting the negative side of a generator with the metallic object and the positive side of the generator with the clay, in which circumstances the object may be brought into intimate contact with the clay, or forced into or through the same without the clay adhering thereto.

We claim:

1. In a brick making machine, in combination with a support for a moving column of clay, means for cutting the clay while in motion into brick lengths, a source of electricity, and means for placing and maintaining the column of clay and said cutting mechanism in the circuit of the said source of electricity.

2. In a brick-making machine, in combination with a support for a moving column of clay, means for cutting the clay while in motion into brick lengths, an electric generator, said cutting means being connected with one side of said generator, and a conductor connected with the other side of said generator and adapted to be engaged by the moving column of clay.

3. In a brick-making machine, in combination with a support for a moving column of clay, means for cutting the clay while in motion into brick lengths, an electric generator, said cutting means being connected with the negative side of said generator, and a conductor connected with the positive side of said generator, and adapted to be engaged by the moving column of clay.

4. In a brick-making machine, in combination with a support for a moving column of clay, means for cutting the clay while in motion into brick lengths, an electric generator, said cutting means being connected with the negative side of said generator, and a conductor mounted on said support and connected with the positive side of said generator, and adapted to be engaged by the moving column of clay.

5. In a brick-making machine, in combination with an endless carrier adapted to receive and be moved by a moving column of clay, cutting mechanism coöperating with said carrier for severing the column of clay into brick lengths, an electric generator, and means for connecting one side of said generator with the moving column of clay, and the other side with said cutting mechanism.

6. In a brick-making machine, in combination with a support for a moving column of clay, cutting mechanism mounted above said support and comprising a series of blades arranged and adapted to cut through the column of clay at predetermined points at right angles to the line of movement of the clay, an electric generator, and means for connecting one side of said generator with the moving column of clay and the other side of said generator with said blades.

7. In a brick-making machine, in combination with the die of an auger machine, a source of electricity, and means for electrically connecting said die and the clay issuing therefrom with said source.

8. In a brick-making machine, in combination with the die of an auger machine, an electric generator, means for connecting one side of said generator with said die, and means for connecting the other side of said generator with the clay issuing from said die.

9. In a brick-making machine, in combination with the die of an auger machine, an endless carrier for receiving a column of clay issuing from said die, a support for the clay between said carrier and the mouth of said die, an electric generator, and means for connecting one side of said generator with said die, and the other side of said generator with the clay through said support.

10. In a brick-making machine, in combination with the die of an auger machine, a support adapted to receive a column of clay forced through said die, cutting mechanism embodying a series of blades adapted to travel in a path to cause them to successively cut through the plane traversed by the column of clay, an electric generator, means for electrically connecting one side of said generator with said clay adjacent to said die and said blades, respectively, said generator having its other side electrically connected to said die and to said blades.

11. In a brick-making machine, in combination with means for severing a moving column of clay into brick lengths, an endless carrier for receiving the severed bricks, a marking wheel mounted for rotation above said carrier and adapted to be engaged by, and in rotating to impress its marks upon the bricks passing thereunder, an electric generator, contact devices adapted to engage the brick as it passes under said marking wheel, said contact-devices being electrically connected with one side of the generator, and said marking wheel being electrically connected with the other side of the generator.

12. In a brick-making machine, in combination with a support for a moving column of clay, cutting mechanism for severing the column into brick lengths, means for in-

denting the clay on opposite sides at points coincident with the subsequent and successive lines of severance, a conductor adapted to be engaged by the moving column of clay, said conductor and said indenting means being connected with a source of electricity.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JOHN R. DAWKINS.
DENNIS PARKS.

Witnesses:
BRUCE S. ELLIOTT,
STELLA HILL.