(No Model.) 2 Sheets—Sheet 1.

D. BROWN.

AUTOMATIC BRICK AND TILE CUTTER.

No. 464,848. Patented Dec. 8, 1891.

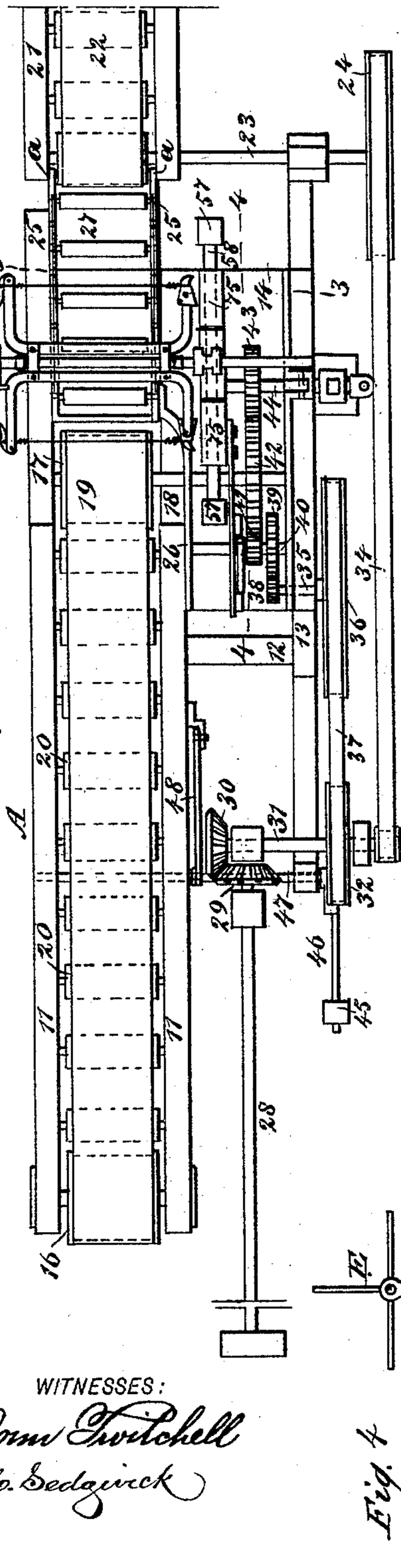

Fig. 1.

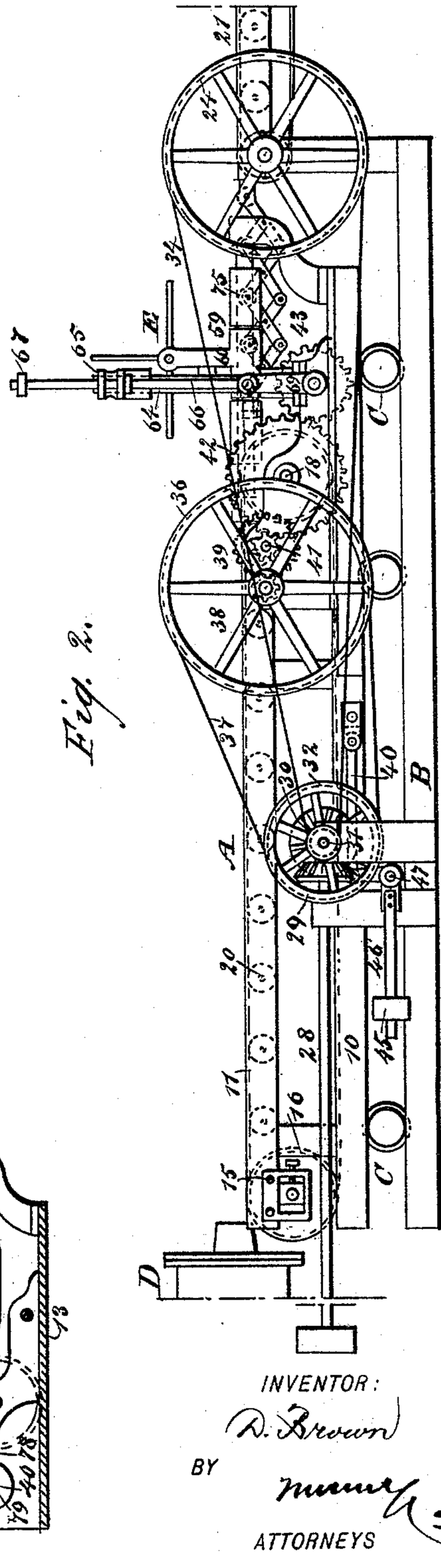

Fig. 2.

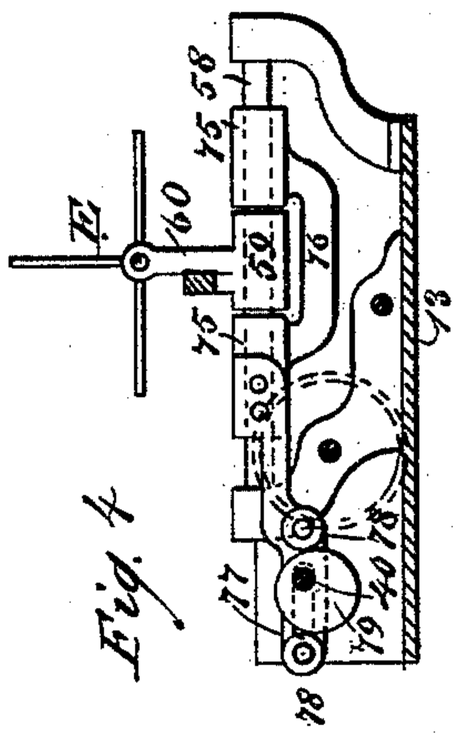

Fig. 4.

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(No Model.) 2 Sheets—Sheet 2.

D. BROWN.

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Fig. 3

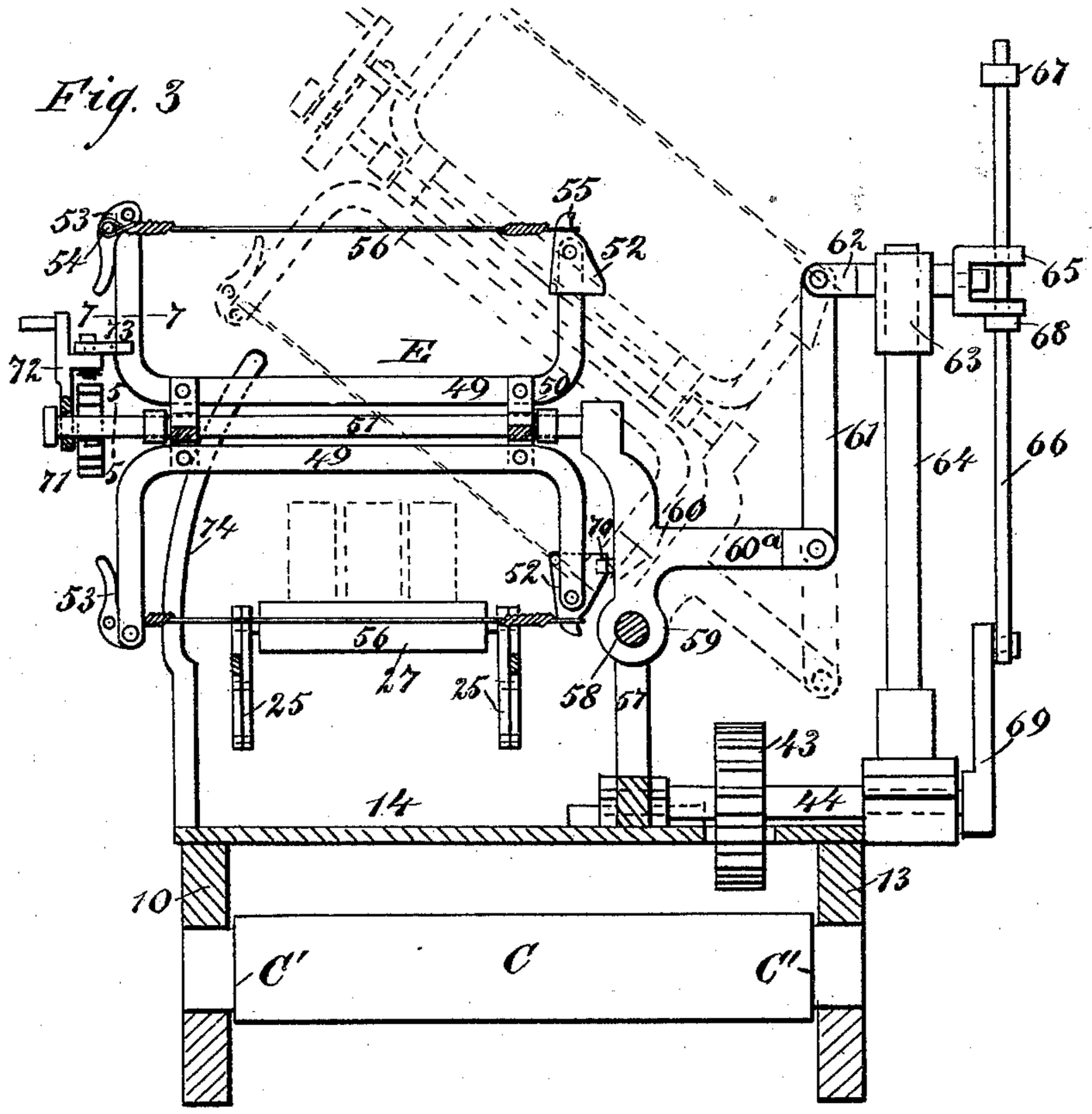


Fig. 5

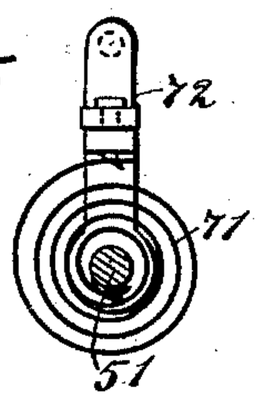


Fig. 7.

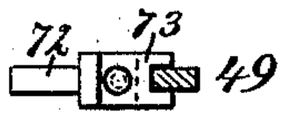


Fig. 6.

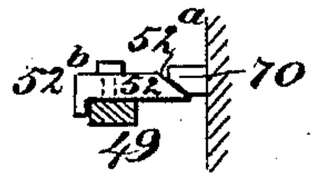
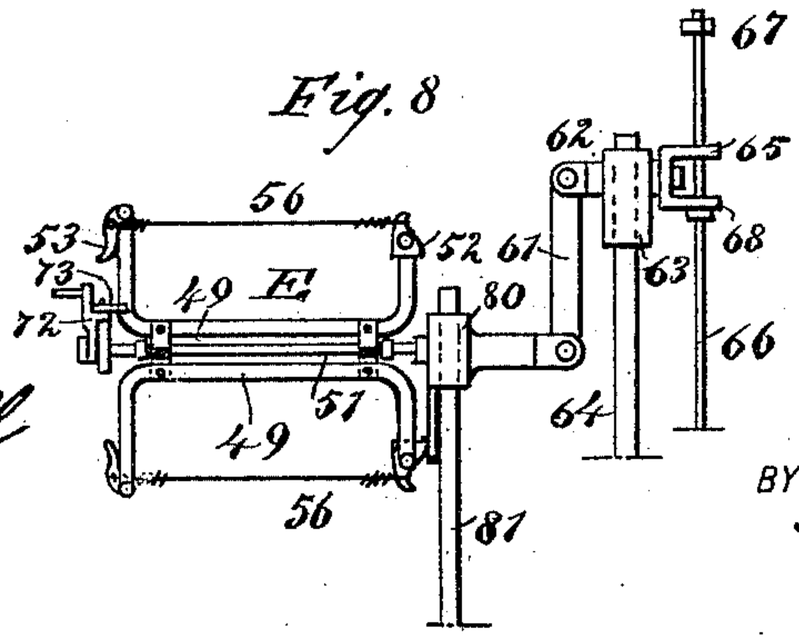


Fig. 8



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UNITED STATES PATENT OFFICE.

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AUTOMATIC BRICK AND TILE CUTTER.

SPECIFICATION forming part of Letters Patent No. 464,848, dated December 8, 1891.

Application filed May 29, 1891. Serial No. 394,503. (No model.)

To all whom it may concern:

Be it known that I, DAVIS BROWN, of Decatur, in the county of Macon and State of Illinois, have invented a new and useful Improvement in an Automatic Cutting Attachment for Brick-Machines, of which the following is a full, clear, and exact description.

My invention relates to an improvement in automatic cutting attachments for brick-machines, and has for its object to provide an attachment especially adapted for use in connection with brick-machines delivering a number of long bars or a continuous bar of clay, and to so construct the attachment that it will automatically operate to cut the bars of clay into suitable lengths for bricks.

Another object of the invention is to provide a brick-cutter which in the event of the cutting-surface becoming damaged or broken will automatically present another cutting-surface to the bar of clay in an exceedingly short space of time.

A further object of the invention is to so construct the cutter that a change of cutting-surface will be made only when the damaged cutter is removed from the bar of clay, and also to provide a means whereby cutting-surfaces may be expeditiously and conveniently attached to their carrying-frame.

A further object is to so construct the table and the measuring-roller belt of the attachment that should the column of clay cease moving the operative parts of the attachment will be simultaneously stopped, and to provide for regulating the driving-speed proportionately to the rapidity of the delivery of the bars of clay.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the machine. Fig. 2 is a side elevation. Fig. 3 is a vertical section taken, practically, on the line 3 3 of Fig. 1. Fig. 4 is a horizontal section taken, practically, on the line 4 4 of Fig. 1. Fig. 5 is a section taken, practically, on the line 5 5 of Fig. 3. Fig. 6 is a plan view of one of the clamping-plates of the cutting-reel, illustrating it in engagement with the stop-lug. Fig. 7 is a section taken, practically, on the line 7 7 of Fig. 3; and Fig. 8 is a side elevation illustrating a slight modification in the cutting-reel.

The table A of the attachment is essentially rectangular in general contour and is very much wider at its delivery end than at its receiving end. At the receiving end of the table two parallel beams 10 are properly connected, which beams support two upper parallel beams 11, the upper beams being directly over the lower ones. The lower beams extend some distance beyond the delivery ends of the upper beams, and said lower beams at one side of the machine have attached thereto transverse beams 12, which are secured to a comparatively short outer beam 13, parallel with the beams 10, as shown in Figs. 1 and 2. Thus while the delivery end of the table is wider than the receiving end said end is essentially rectangular.

Upon the beam 13 one side of a plate 14 is rigidly bolted, which plate extends over and is attached to the outer beam 10 of the main portion of the table, as is illustrated in Fig. 3. The table is mounted upon a base B, which base corresponds in shape to that of the table, and between the table and the base a series of friction-rollers C is located, said rollers at their outer ends being reduced, forming shoulders C′, and the said reduced ends are of a length essentially corresponding to the width of the beams upon which they rest, as is also shown in Fig. 3. Thus the rollers when placed in position do not leave it.

At the delivery end of the machine, in suitable hangers 15, the trunnions of a large roller 16 are journaled, the said roller being located between the beams 10 and 11 transversely of the table, as is shown in Figs. 1 and 2, and in front of the delivery ends of the upper beams 11 of the table a measuring-roller 17 is journaled in the table, the shaft 18 of which roller extends from side to side of the frame-extension. The rollers 16 and 17 are adapted to

carry an endless belt 19 and support the upper section of the belt in such a manner that it will be essentially flush with the upper faces of the table-beams 11. Intermediate of the rollers 16 and 17 smaller rollers 20 are journaled in the beams 11, as is likewise best shown in Figs. 1 and 2.

The roller 16 of the table is adapted to be located close to and beneath the delivery-spout of the brick-making machine D, and the bar of clay formed by the machine is delivered upon the belt 19, which may be termed a "measuring-belt."

In front of and spaced some distance from the front or delivery end of the table any approved form of conveyer 21 is located, the cut brick being adapted to be delivered from the table to the endless belt 22 of the conveyer. The conveyer is driven independently of the mechanism of the table, and its drive-shaft 23 is provided with a suitable driving-pulley 24, connected in a manner to be hereinafter set forth.

The table A and the conveyer 21 are united by opposed parallel sets of lazy-longs 25 or the equivalents thereof, and these lazy-tongs are preferably secured to the rear ends of the conveyer-frame, as illustrated at *a* in Fig. 1, and to the upper beams 11 of the table through the medium of a bar or bracket 26 or the equivalent thereof, one of said bars or brackets being illustrated at one side of the table only; but the table may be provided with a duplicate at the opposite side, if deemed advisable. The side pieces of the lazy-tongs 25 have journaled therein a series of rollers 27, the upper surfaces of which rollers are practically in a plane with the upper surfaces of the measuring-belt 19 and the conveyer-belt 22.

The object of mounting the table upon the rollers C is to enable the table to move freely backward and forward when occasion may demand under the path of the molded slabs or bars of clay to be cut into brick lengths.

The measuring-roller 17 is in circumference some multiple of a brick length less the thickness of the belt and plus a slight allowance for the slipping of the belt, and with its shaft 18 is geared a driving mechanism and also the cutting mechanism, to be hereinafter described.

The power is supplied independently from a drive-shaft 28, located at the side of the table at which the extension occurs. This drive-shaft is preferably provided with a bevel-gear 29 at one end, which meshes with a similar gear 30, located upon a shaft 31 in front of and at a right angle to the main or driving shaft 28. This shaft is supported in suitable bearings, and near its outer end is provided with a peripherally-grooved pulley 32, fixed thereon, and at its extremity with a smaller pulley 33, connected by a belt 34 with the driving-pulley 24 of the conveyer, and by this means the conveyer is propelled at a rapid and uniform rate of speed.

In the extension of the table at its outer side a short shaft 35 is journaled, carrying a large peripherally-grooved pulley 36 upon its outer end, connected with the smaller pulley 32 by a belt 37, and upon its inner end the shaft 35 has a pinion 38 secured, meshing with a gear 39 upon a shaft 40, journaled transversely in the extension of the table between the shaft 35 and the shaft 18 of the measuring-roller. The shaft 40 communicates movement to the measuring-roller shaft 18 by a pinion 41, meshing with a gear 42 upon the measuring-roller shaft, and this gear 42 likewise meshes with a pinion 43, fast upon a transverse shaft 44, adapted to impart movement to the cutting mechanism, as will be hereinafter stated.

The driving-shaft 28 runs constantly at a speed slightly above the highest speed that will be required to drive the cutting mechanism to cut the greatest number of bricks that can be molded by the machine to which the device is attached or in connection with which it is used, and the volume of power required to operate the cutting mechanism is controlled by the bar or bars of clay issuing from the machine, as the said bar or bars of clay are brought into frictional engagement with the belt 19 of the table and the table is free to move upon the rollers C. The flexible connections 25 between the table and the conveyer admit of movement to the former without being disengaged from the latter, which is stationary.

The volume of power varies from various causes, and to accommodate this variation the table A near its receiving end is normally held back by a weight 45, adjustably located upon a crank-arm 46, attached to the outer end of a shaft 47, as shown in Figs. 1 and 2, the inner end of which shaft is pivotally connected by a link 48 with the narrower portion of the table at the rear of its extension. When the weight 45 has drawn the table backward a certain distance, the pulley 36, carried by the table, is drawn in the direction of the fixed pulley 32, and the belt 37, connecting the two pulleys, is consequently slackened, and as this belt 37 supplies power to the measuring-roller and to the driving mechanism the operation of said parts is stopped. As the bar or bars of clay emerge from the machine their frictional contact with the belt 19 of the table will be sufficient to carry the table forward against the resistance of the weight 45 a sufficient distance to tighten the belt 37 and thereby set the operative mechanism in motion, and at that time the measuring-roller will attain a uniform speed with that of the bar or bars of clay to be severed into bricks. Should the bar or bars of clay slow up or cease to issue from the machine, the weight 45 will act to draw back the table and cause the driving-belt 37 to slip, and no more power is then transmitted than that actually required to maintain a uniform

speed with that of the column or bars of clay issuing from the brick-making machine.

The cutting mechanism consists of a reel E, which reel is preferably made up of a number of yoke or bow shaped arms 49, connected by sleeves 50, through which sleeves are passed the reel-shaft 51. The bow or yoke shaped arms seem to radiate from the shaft, and at the extremity of one member of each arm a clamping-plate 52 is eccentrically pivoted, and at the extremity of the opposite member an eccentric-lever 53 is located. The eccentric-lever is provided with a pin 54 eccentric to its fulcrum, and the clamping-plate 52 is preferably somewhat triangular in general contour, one side edge 52^a being beveled, as shown in Fig. 6. At the contracted end of the plate a hook-like projection 55 is formed.

The cutting of the clay into bricks is preferably effected through the medium of wire strands 56, the said strands of wire having eyes formed at their extremities. One strand is used in connection with each bow or yoke shaped arm, and the eye of a wire is passed over the hook-shaped extension of a clamping-plate and over the pin 54 of the opposite eccentric lever when said lever is in an upper position. By forcing the lever downward to a lower position, as shown in Fig. 3, the wire is stretched and maintained in this stretched position, as the clamping-plate cannot move backward farther than a parallel position upon the member of the arm to which it is pivoted by reason of a lip 52^b, formed upon the plate and engaging with one edge of the arm, as is best shown in Fig. 6.

Upon the plate 13 of the extension of the table, a little distance from the main portion thereof, two posts 57 are erected, which constitute supports for a shaft 58. Upon the shaft 58 a sleeve 59 is held to slide, provided with an angular arm 60, in the vertical member of which arm the outer end of the reel-shaft 51 is secured. The horizontal member 60^a of the angle-arm 60 has attached thereto an upwardly-extending link 61, which in turn, at its upper end, is connected with a horizontal link 62, and the latter link passes through a sleeve 63, capable of vertical movement upon a post or standard 64, attached to the extension of the frame, as is best shown in Fig. 3. The outer end of the upper link 62 has swiveled thereon a block 65, and through the block a rod 66 is loosely passed, ordinarily provided at its upper end with a cap 67, and intermediate of its ends with a second cap or collar 68, the lower end of the rod being pivotally connected with a crank-arm 69, which is fast upon the outer end of the shaft 44. Thus by the rotation of the shaft 44 and the movement of the crank-arm 69 the cutting-reel E is given a rocking movement, its pivot being the shaft 58. When the reel is carried to a horizontal position, (shown in positive lines, Fig. 3,) the lower strand of wire will enter the clay passed over the series of rollers 27 and divide it from top to bottom. After this division is made a further movement of the shaft 44 will carry the cutting-reel out of engagement with the clay to the inclined position shown in dotted lines, Fig. 3. The lowermost arm of the reel is held in a cutting position by the engagement of the clamping-plate of said arm with a stud 70, located upon the angle-arm 60, and the two are held in engagement by a spring 71, coiled around the outer end of the reel-shaft, one end of the spring being secured to the shaft and the other end to a crank-arm 72, loosely mounted upon the shaft and provided with a clutch-bar 73, engaging with a member of the the uppermost arm.

The reel is prevented from turning when in its lower position and under any circumstances by a guard-bar 74, which is carried upward and engages with the reel when in its lower or cutting position, at a side opposite that at which the clamping-plate of the lower arm engages with the stud 70.

It is very important that when the reel is brought down to cut the clay it should be moved in the same direction as the clay and at the same rate of speed, and that it should continue to move in direction of the clay until the cutting-strand 56 has entirely left the latter, and it is further important that it should be carried back at that moment a sufficient distance to sever the clay in a length corresponding to that of a brick at the next downward movement of the reel. This is effected by placing a sleeve 75 upon the shaft 58 at each side of the sleeve 59, as shown in Figs. 1 and 4, which sleeves are connected at their lower side by a yoke 76, and one sleeve has projected therefrom an arm 77, carrying two spaced friction-rollers 78. Upon the shaft 40 a cam 79, of suitable shape, is secured, which alternately engages with the friction-rollers 78 and moves the reel to and from the receiving and delivery ends of the table at proper times. In the event that the strand 56 should break, at the next upward movement of the reel, when the reel is clear of the guards 74, the spring 71 will compel the clamping-plate of the severed strand to leave the stud 70 and the reel will be revolved by the spring until the next upper arm is brought down to the cutting position and this plate engages with the said stud 70. Thus the only loss in the clay will be the length of one brick, or one cut, and the severed strand of wire may be replaced at will.

In Fig. 8 I have illustrated a slight modification in the mechanism for moving the reel. In Fig. 3 the reel is shown as moved upon a pivot that is carried from a horizontal to an upper diagonal position. In Fig. 8 the movement of the reel is made in a horizontal line, and this is effected by dispensing with the shaft 58 and the sleeve 59 and attaching the reel-shaft to the sleeve 80, free to move upon an upright 81, which is a substitute for the

shaft 58, a link connection being effected between the sleeve 80 and the operating-rod 66 in like manner to that heretofore described.

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

1. The combination, with the sliding cutting-table provided with a measuring-roller belt and the offtake-belt, of a longitudinally-extensible section between the adjacent ends of the two belts, over which the several articles pass to the offtake-belt, substantially as set forth.

2. The combination, with the sliding cutting-table having a measuring-roller belt, mechanism for driving the belt, thrown into action by the sliding of the table by the entering mass of clay, and the offtake-frame and its endless belt, of an extensible section connected to the adjacent ends of the said two frames, contracted and expanded by the sliding action of the first-named frame and provided with transverse rollers, subtantially as set forth.

3. A cutting-table for brick-machines, having a section of its sides formed as lazy-tongs and provided with rollers journaled in the tongs transversely of the table, substantially as described.

4. In a brick-machine, the combination, with a cutting-table having a section of its sides formed as lazy-tongs and provided with supporting-rollers journaled in the tongs transversely of the table, of an offtake or delivery table connected with the lazy-tongs section of the cutting-table and moving at a higher rate of speed than said cutting-table, substantially as described.

5. In a cutting attachment for brick-machines, the combination, with a machine capable of molding bars or columns of clay, of a table capable of movement to and from the mouth of said machine, a measuring-roller belt carried by the table, a driving mechanism for the belt, and a weight connected with the table, which, together with the bars of clay delivered by the machine to the measuring-roller belt, constitute shifters for the driving mechanism, substantially as described.

6. In a cutting attachment for brick-machines, the combination, with a machine capable of molding bars or columns of clay, of a table capable of longitudinal reciprocation, a measuring-roller belt carried by the table, a reciprocating cutter located at one end of the belt, a driving mechanism, substantially as described, operating the belt and the cutters, and a shifting mechanism comprising a balance-weight connected with the table and whose resistance is overcome by the frictional contact of the bar clay delivered from the machine to the measuring-roller belt, as and for the purpose specified.

7. In a cutting attachment for brick-machines, the combination, with a table capable of longitudinal reciprocation, a measuring-roller belt carried by the said table, and a shifting weight attached to the table, of a conveyer, a flexible connection between the table and the conveyer, said connection being provided with friction-rollers, a clay-cutting device held to reciprocate over the flexible connection of the table and the conveyer, and a driving mechanism, substantially as described, controlled by the weight and the measuring-roller belt, the said mechanism being adapted to drive said belt and said cutter, as and for the purpose specified.

8. In a cutting attachment for brick-machines, the combination, with a bed and a driving mechanism, of a cutter laterally reciprocated by the driving mechanism, the said cutter comprising a yoke-like arm, a clamping-plate eccentrically pivoted upon one member of the arm, an eccentric lever pivoted upon the opposite member of the arm, and a strand of wire attached to and stretched by the said plate and lever, as and for the purpose set forth.

9. In a cutting attachment for brick-machines, the combination, with a bed and a driving mechanism, of a cutting-reel operated by the said driving mechanism, the said reel consisting of a shaft pivotally connected with the table, spring-controlled yoke-like arms radiating from said shafts, said arms being provided upon one member with an eccentrically-pivoted clamping-plate and upon their opposite members with eccentric levers, and cutting-strands carried and stretched by the said plates and levers, as and for the purpose set forth.

10. In a cutting attachment for brick-machines, the combination, with a table and a driving mechanism, of a reel-cutter reciprocated by the driving mechanism, the said cutter comprising a shaft and yoke-like arms pivotally connected with the shaft, one member of said arms being provided with eccentrically-pivoted essentially-triangular clamping-plates, the other members having fulcrumed thereon eccentric levers, and cutting-strands carried and stretched by the clamping-plates and levers, a stop located upon the fulcrum of the reel and adapted for engagement with the clamping-plates, a guard engaging with the reel when in its lower or cutting position, a clamp engaging with one of the arms of the reel, and a spring coiled around the reel-shaft, attached thereto and to the reel-clamp, as and for the purpose set forth.

11. In a cutting attachment for brick-machines, the combination, with a carrying mechanism adapted to feed forward bars of clay, and a driving mechanism, of a fixed shaft, a sleeve held to slide upon the shaft, said sleeve being adapted to carry a cutting mechanism, and connected sleeves located at each side of the cutting-mechanism sleeve, a cutting mechanism comprising a reel capable of turning upon a shaft fixed to the intermediate sleeve, a clamp pivoted upon the reel-shaft, engaging

with one arm of the reel and pressed by a spring attached to and coiled around the shaft, a stop attached to the intermediate sleeve and engaging with an arm of the reel, a guard engaging with the reel when in its lower or cutting position, and a cam-and-link connection between the connected sleeves and the driving mechanism, the said cam being timed to operate to carry the cutting mechanism forward at a speed equivalent to the travel of the clay-carrying belt, as and for the purpose set forth.

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