

(No Model.)

4 Sheets—Sheet 1.

J. O. LUDLAM & J. L. MCKITTRICK.

BRICK OR TILE CUTTING MACHINE.

No. 577,870.

Patented Mar. 2, 1897.

Fig. 1.

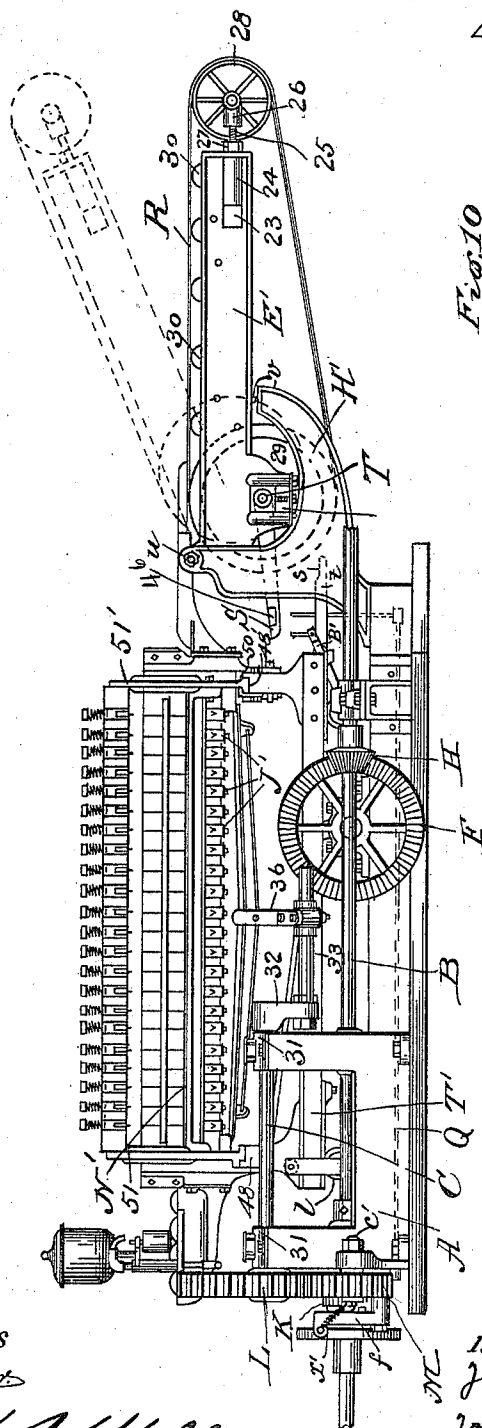
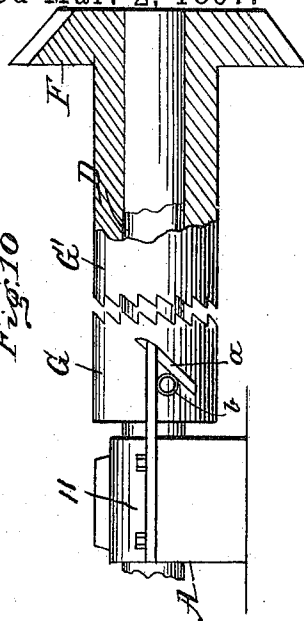


Fig. 10.



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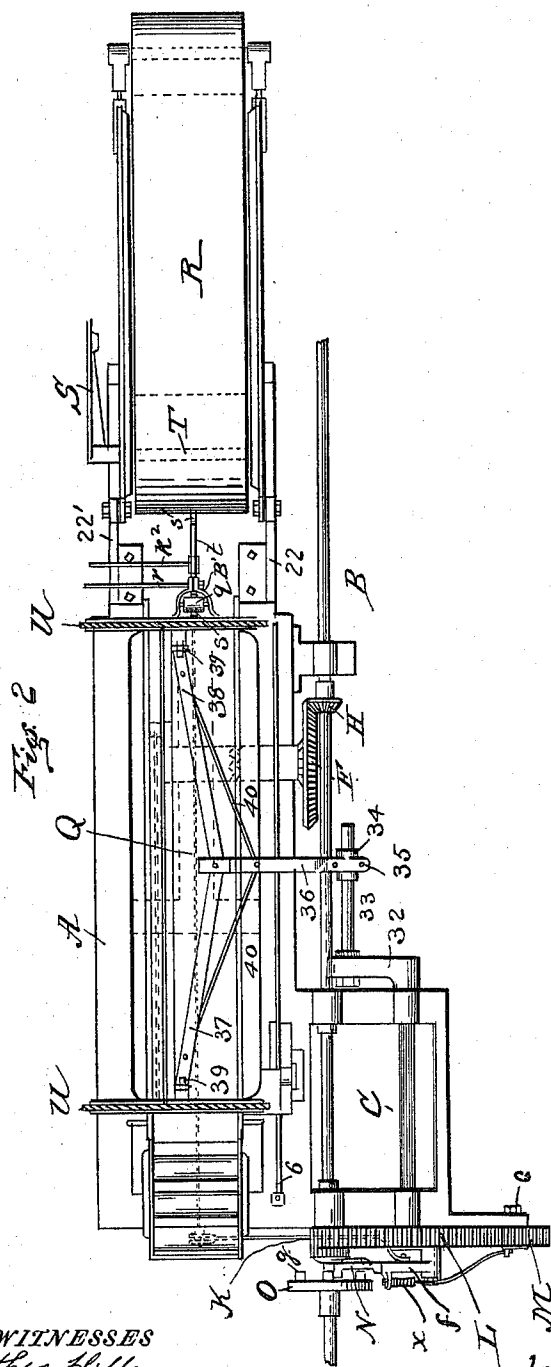
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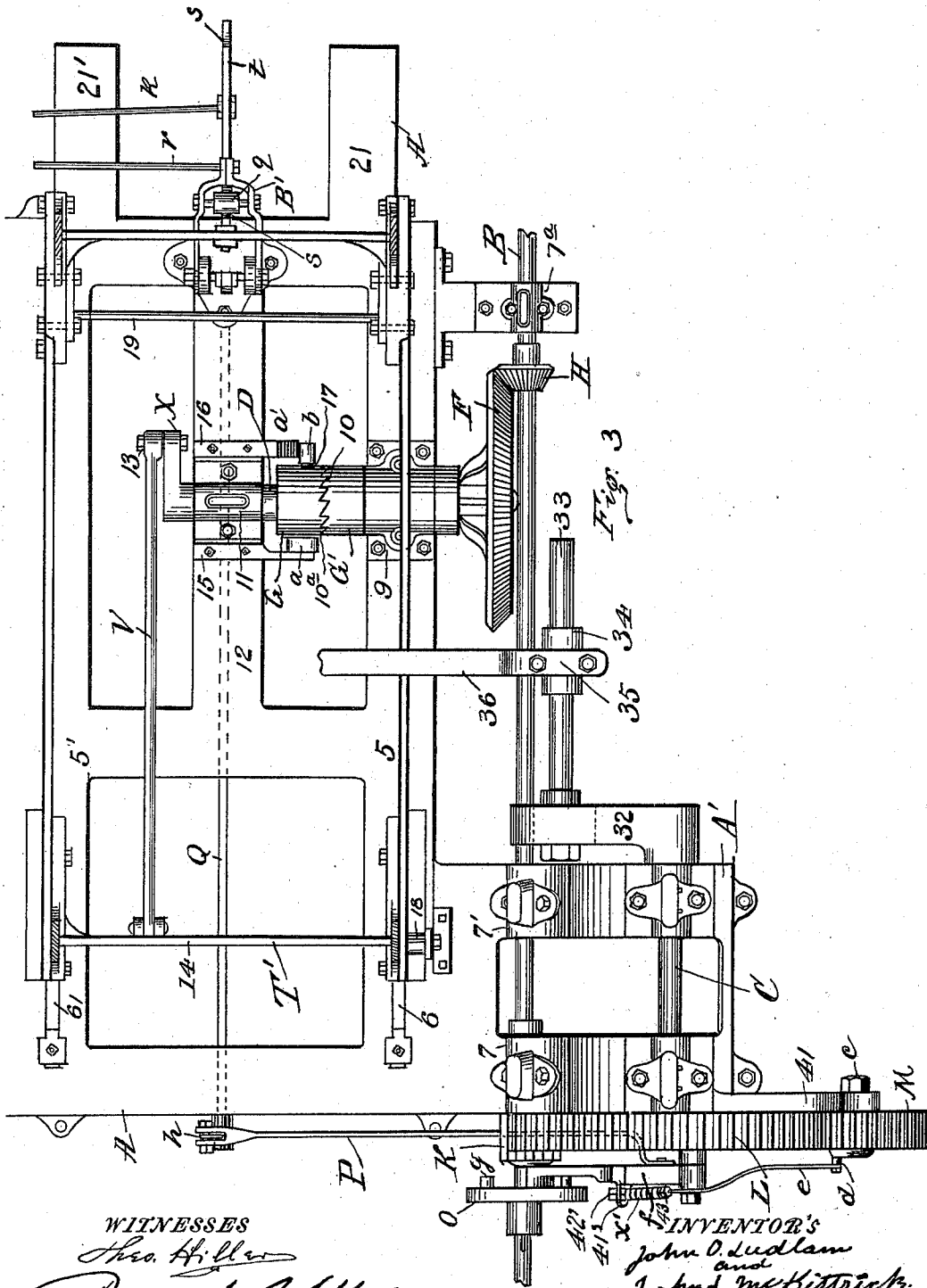
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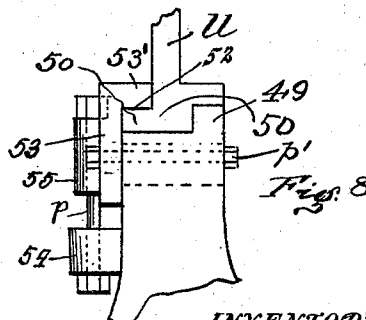
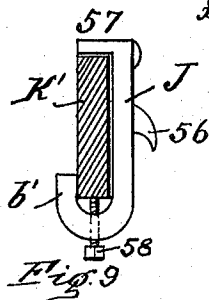
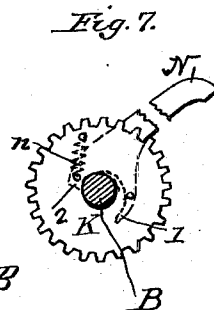
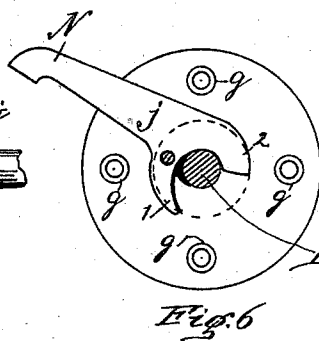
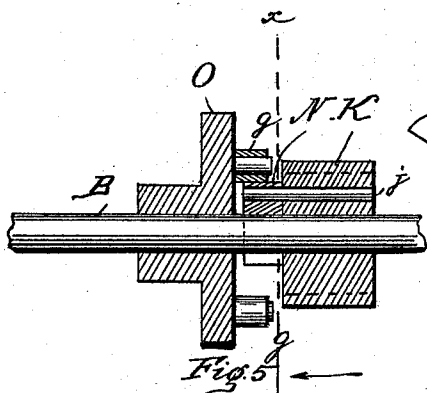
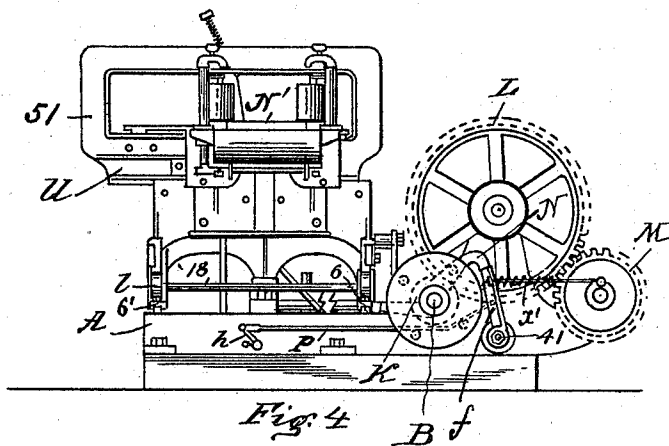
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UNITED STATES PATENT OFFICE.

JOHN O. LUDLAM AND JOHN L. MCKITTRICK, OF CANTON, OHIO.

BRICK OR TILE CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 577,870, dated March 2, 1897.

Application filed April 13, 1896. Serial No. 587,252. (No model.)

To all whom it may concern:

Be it known that we, JOHN O. LUDLAM and JOHN L. MCKITTRICK, citizens of the United States, and residents of Canton, county of Stark, State of Ohio, have invented a new and useful Improvement in Brick or Tile Cutting Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

The invention relates to a brick and tile cutting machine.

The object is to provide a machine that is timed or controlled by the movement of the clay; that will automatically cut the column of clay into predetermined lengths when it reaches the proper position on the table; furthermore, to improve and simplify the construction of the carrying-off table, and finally to provide a machine of this character which will be simple of construction, durable in use, and comparatively inexpensive of production.

With these objects in view the invention consists of certain features of construction and combination of parts, which will be hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of the complete machine, the normal position of the carrying-off table being shown in full lines and the tilted position being indicated in dotted lines. Fig. 2 is a plan view wherein the cutting-frame is removed to show the transversely-laid tracks, the end pieces of the cutting-frame, and the forked pull-rod. Fig. 3 is a plan view of the machine on a larger scale than that of Fig. 2, the upper portion of the longitudinally-reciprocating carriage and the cutting-carriage and wire frame being removed. Fig. 4 is an end view of the machine, looking from the left of Fig. 1. Fig. 5 is a longitudinal central section through the loose pinion and the pawl-actuating wheel and through the fulcrum-point of the hub of the pawl. Fig. 6 is a sectional view on line $x x$, Fig. 5, looking in the direction of the arrow. Fig. 7 is a side view of the pinion and the pawl. Fig. 8 is a detail view showing the construction of the ways or tracks for the transversely-moving cutting-frame. Fig. 9 is a transverse section through the lower bar of the cutting-frame with one of the lower wire-holders arranged thereon.

Fig. 10 is an enlarged detail of the clutch mechanism for actuating the longitudinally-movable carriage.

In the drawings, A designates a suitable frame or bed formed or composed of parallel side pieces 5 5' of such length as may be required to have the track-rails 6 6' laid and secured thereon for the longitudinally-reciprocating carriage to run upon. At the front end of the bed A is formed or constructed a laterally-extended bed A', on which the mechanism for throwing the wire frames is mounted, substantially as shown in the drawings.

In bearing-boxes 7 7', formed on or secured to the bed-frame, is journaled a main shaft B, leading from any proper power connection and source (not shown) competent to actuate the associated mechanism. On the shaft B, which has a continuous rotation, is mounted and secured a bevel-pinion H, in mesh with a large bevel gear-wheel F, the hub G' of which is hollow and journaled in a bearing 9 on the side sill or piece of the bed and held against endwise movement in its bearing, as shown, and formed on its inner end with clutch-teeth 10. In the bore of the hub or sleeve G' is loosely disposed a rock-shaft D, having its inner end portion journaled in a bearing 11 on a central plate 12 of the bed. On the end of the shaft D is a crank-arm X, in the free end of which is a crank-pin 13, on which is pivotally mounted the end of a pitman V. The other end of the pitman is pivotally connected to the end cross-piece 14 of the longitudinally-reciprocable carriage T', as shown in Fig. 3 of the drawings. On the shaft D is splined a clutch G, the other end of which is formed with clutch-teeth 10^a, which engage with the teeth 10 on the end of the hub G'. To automatically engage and disengage the clutch the following-described means are provided: On the central plate 12 are strongly secured two oppositely-arranged bars 15 16, parallel to each other and in alignment with the axis of the clutch, as shown. To the projecting end of the bar 15 is fixed or formed as part thereof a flange or bar a , inclined inwardly and downward from the outer end or point, as shown in Fig. 10 of the drawings, and the bar 16 is formed with an incline a' , the incline being from the inner portion outward and downward, as shown in

Fig. 3 of the drawings. On the clutch G is formed or secured a radially-arranged pin 17, on which is mounted an antifriction-roller *b*, which is arranged and intended to ride on the respective inclines *a a'* and to thus move the clutch-section G into and out of engagement with hub or clutch section G'. It being premised that the carriage T' is pushed out by the column of clay as moved onto the platen of the cutting-table, as hereinafter more fully specified, it will be perceived that when the carriage T' has been moved outward to its limit, as shown in Fig. 3, the roller *b* on clutch-section G' will engage the incline *a'* and force the said section G into engagement with section G', and the shaft D will be rotated one half-revolution by the gearing F and H and the continuously-rotating shaft B throwing the crank over and carrying the carriage back to its point of starting, and at the same time the roller on the clutch will be carried over and into contact with the incline *a*, down which it will ride and release the clutch, and the table will be in a position to receive the column of moving clay, which in its progress gradually advances the carriage and throws the crank over into the position seen in Fig. 3. The roller *b* will engage and ride down the incline *a'* and lock sections G and G' together in the manner above described to effect the return of the carriage.

The longitudinal reciprocable carriage T' may be of any suitable construction. We have illustrated it as consisting of a substantial rectangular body or frame mounted on axles 18 19, carried by suitable flanged wheels *l*, running on the tracks 6 6'.

To hold the carriage T' locked at the limits of its reciprocations, a yoke B' is pivotally mounted on the bed-frame and has journaled in its upper portion a roller *q*. The frame of the yoke stands at an upward incline from its pivotal point, as seen in Fig. 1 of the drawings, in which position the roller *q* bears and runs on a rigid bar *t*, secured to the end of the carriage T', the bar *t* being formed with notches *s s'* into which the roller drops when the carriage has made its movement in either direction, and is there held until a laterally-projecting rod *r*, secured to the end of the yoke, is lifted to disengage the roller from either of the notches. The rod *r* is lifted by an arm S on the shaft T of the measuring-drum of the timing or carrying table.

R designates the timing or carrying table of the following-described construction: On the end extensions 21 21' of the bed-frame are rigidly mounted oppositely-arranged standards 22 22', provided with suitable bearings *u* in their upper ends and formed with rearwardly-projecting and upward-curved arms H', in the ends of which are fitted adjusting-screws *v*, whereby the position of the carrying-frame may be adjusted vertically.

E' designates the carrying-table frame, comprising two side plates of the required length and dimensions pivotally hung in the

bearings *u* and adapted to rest with their lower edges on the adjusting-screws *v*, as shown in Fig. 1, and provided with longitudinal slots 23 in their end portions, in which slots are disposed sliding blocks 24, formed with screw-threaded stems 25, projected through the ends of the side plates and carrying bearing-boxes 26 on the ends of the stems. On the screw-threaded stems 25 are mounted adjusting-nuts 27, whereby the bearings may be extended and retracted to produce the desired tension on the carrying-apron. In the bearings 26 is journaled the end drum 28 of the carrying-apron R, arranged on the drum 28 and carried around the main drum 29, as shown. In the side pieces of plate E' are journaled a number of rollers 30, arranged to carry the upper line of the apron on a horizontal plane. The drum 29 is keyed to a shaft T, journaled in bearings disposed in the frame E', as shown. The object of hinging the carrying-table in the manner described is that it may be tilted up out of the way when not in use, as shown in dotted lines, and to provide convenient access to the bearings in which the main drum rotates.

The object of the mechanism comprising the drum 29, apron R, trip S, and cooperating parts is to provide means by which the flow of clay, whether in solid column or cut into the form of brick, moving together in the form of a column on or engaging the carrying-apron R and drum H to rotate the arm S to automatically trip the locking mechanism and throw the cutting devices into action.

On the shaft B is loosely mounted a pinion K in mesh with a large gear-wheel L, fixed on a shaft C, journaled in bearings 31 31 in standards issuing from the frame A'. On the shaft C is a crank-arm 32, in the free end of which is secured a bar 33, horizontally arranged, and on the bar 33 is arranged a loose sleeve 34, carrying a stirrup 35 of a pull-bar 36, from the inner end of which are projected oppositely-arranged bars 37 38, having their outer ends suitably fastened to the end pieces of the transversely-reciprocating cutting-frame, as seen at 39 in Fig. 2 of the drawings.

Brace-rods 40 are provided to strengthen and brace the bars 37 38. On an extension of the frame A' is formed a standard or bracket 41, in which is fixed a stud-bearing *c*, having journaled thereon a pinion M, in mesh with the larger gear-wheel L, and on the pinion M is a crank-pin *d*, to which is suitably pivoted one end of a bar or rod *e*. This rod *e* has its other end projecting through an ear 41' of a rock-arm *f*, pivotally supported on the frame of the machine, and is secured thereto by a nut 42'. A spring *x* is coiled around said rod *e* and is confined between the ear 41' and a fixed collar 43 on the rod.

To the arm *f* is pivotally secured one end of a rod P, having its other end connected to a crank-arm *h* on a rocking rod Q, which extends longitudinally through the machine in

suitable bearings and projects beyond the end of the carriage, and has fixed on the end thereof a laterally-projected lever *k*, the end of which is in the path of the lug 46 on the rotating arm S, secured to the shaft of the main drum. On the shaft B is fixed a disk-wheel O, on the inner face of which is suitably mounted four antifriction-rollers *g*, radially arranged. To the loose pinion K is eccentrically fulcrumed, by a pin *j*, a pawl N, the hub of which is bifurcated, as at 1 2, and straddles the shaft B, the recess between the arms of the hub being eccentrically curved to afford a limited play on the shaft and the arm 2 being made longer than the arm 1 to adapt it to be moved up into the path of the rollers *g* by the spring *n*, when the arm *f* is pushed from engagement with the end thereof by the rod P against the action of the spring *x'*, whereupon the arm 2 is moved up into engagement with one of the rollers, which engagement locks the loose pinion K, so as to turn with the shaft B, and thus actuate the intermeshing gearing to draw the cutting-table across the column of clay and sever it into the desired forms. After the column of clay has been cut and the cutting-frame returned to its normal position (during which time the wheel M has been making its revolution and holding the arm *f* out of the path of movement of the revolving pawl N) the wheel M moves the arm *f* into the path of movement of the pawl N, which contacts with the arm *f* and draws the arm 2 of the hub from engagement with the roller on the disk O and thus stops the actuating mechanism of the cutting-frame.

On the longitudinally-reciprocating carriage are laid and secured transversely-arranged tracks 48 48', formed on their outer face edges with vertical flanges 49, on which the coinciding end pieces 50 of the transversely-reciprocating cutting-frame rest and slide. The cutting-frame comprises end supports 51 51', having their bottom faces formed counterparts of the tracks on the carriage and having on their inner top edges flanges 52. To the inner faces of the tracks is secured a keeper-plate 53, having an edge flange 53', which sets on the flanges 52 to hold the cutting-frame down and against vertical displacement. The keeper-plate 53 is secured to the tracks by means of fastening-bolts *p'*, projected through the parts, as shown, and the plates are held against upward movement by means of bolts *p*, projected through ears 54 on the track-bodies and vertical sleeves 55 on the keeper-plates, as shown in Fig. 8 of the drawings.

The cutting-frame is of any approved construction, the upper ends of the cutting-wires being held adjustably and yieldingly in the frame by any suitable means and having their lower ends connected to hooks 56, formed on adjustable brackets J, formed with lateral flanges 57 to set over and rest on the top edge of the lower cross-bar K' of the cutting-frame

and having its lower end turned up to take in the lower edge portion of the cross-bar, as at *b'*, and through the middle of the curved or hooked part of the bracket is projected an adjusting and tightening screw 58. It will be readily perceived that by means of the screw 58 the brackets may be firmly held to the cross-bar in any position in which placed.

In operation the clay is delivered in desired form from the clay-mill onto the cutting-table N' and passed on over, and in so doing will move the table and turn the crank X to the position shown in Fig. 3, at which instant the roller *g* will drop into the recess *s*, provided in bar *t*, to hold the frame T' in a locked relation to frame A. At this instant the clay, either in solid column or cut in form of brick, will pass onto the apron R and move the same to rotate the drum H and arm S, trip the mechanism by which the cutting table and apparatus is set in motion, the drum H serving as a measuring device to determine the frequency of the cut by the speed with which the arm S is rotated to trip the cutting mechanism, which movement is solely dependent on the engagement of the clay with the receiving-apron R and roller H. The usual bearing-off apron or table, having a slightly-increased speed, is used in connection with apron R to separate and bear off the brick, so, as before stated, the clay engages the apron and the drum H' will move the arm S or the lug 46 thereon to lift arm *k*, which in turn will rock the shaft Q, which will, by its connection with arm *f*, force the arm back against the spring *x'* to release the pawl N to allow the spring *y* to throw the prong 2 out into the track of the roller *g*, thereby locking pinion K to the disk-wheel O and shaft B, by which the wheel L and crank Y' will be rotated to move the cutting-table U across or transversely to cut the clay thereon into brick or tile. At the instant of completion of the transverse movement of the cutting-table the roller *b* will have passed on plane *a'* to carry clutch G into engagement with clutch G', by which shaft D and crank X will be rotated a distance to carry crank X to the side opposite to that shown in Fig. 3. The roller *b* having engaged plane *a*, the clutch G will be drawn drawn back or disengaged from clutch G' and the crank X and frame A stopped at the place of beginning, which is opposite that shown in Fig. 3.

It will be understood that the several movements must be timed to produce the described results.

What we claim is—

1. In a brick and tile cutting machine, a suitable supporting stationary bed-frame, a longitudinally-reciprocating carriage mounted on the said bed-frame, a transversely-reciprocating cutting-frame on the carriage, a shaft journaled on the bed and provided with a crank-arm, a connecting-rod between the crank and the longitudinally-movable carriage, a gear-wheel provided with a hollow hub

or clutch member, a clutch member splined on the shaft, and provided with a radially-projecting roller, a guide in the path of the roller when rotated by the gear-wheel to separate the clutch members, substantially as set forth.

2. In a brick and tile cutting machine, a suitable supporting stationary bed-frame, a longitudinally-reciprocating carriage mounted on the bed-frame, a transversely-reciprocating cutting-frame on the carriage, a shaft journaled on the bed-frame, provided with a crank-arm, a connecting-rod between the crank-arm and the carriage, a gear-wheel formed with a hollow hub or clutch member loosely journaled on the said shaft, a clutch member splined on the shaft, a radially-arranged friction-roller on the last-mentioned clutch member, an incline a down which the roller travels to disengage the clutch members, and a reverse incline down which the roller travels to engage the clutch members, substantially as set forth.

3. In a brick and tile cutting machine, the combination with the longitudinally-reciprocating carriage, of a line-shaft B, provided with a bevel-gear H, a bevel gear-wheel F, meshing with the gear H, formed with a hollow hub G', having clutch-teeth on its inner end, a clutch G, a shaft D splined in the clutch and loose in the hub, a crank on the shaft, a connection between the crank and carriage, a radially-arranged roller b , on the clutch, and oppositely-arranged inclines in the path of the roller, whereby the clutch is thrown into and out of engagement, substantially as set forth.

4. In a brick and tile cutting machine, the combination with the longitudinally-reciprocating carriage, of a bar rigidly secured to and projecting from the rear end thereof, and formed with notches at a determined distance apart, a roller journaled in movable bearings and arranged to bear on the rigid bar and engage in the notches, to hold the carriage against movement, and means to lift the roller from the notches and permit the carriage to resume movement, substantially as set forth.

5. In a brick and tile cutting machine, the combination with the longitudinally-reciprocating carriage, of a bar rigidly secured to and projecting from the rear end of the carriage, and formed with notches, a yoke pivotally mounted on the bed-frame, a roller in the yoke to ride on the bar and engage in the notches, a rod projected laterally from the free end of the yoke, and a rotatable arm to lift the rod and raise the roller, substantially as set forth.

6. In a brick and tile cutting machine, the combination with the bed-frame, the longitudinally-reciprocating carriage, and the carrying-table, of a frame pivotally supported on the bed-frame, a roller journaled in the free end of the frame, a rigid bar formed with notches, projecting from the reciprocating carriage, in the path of the roller, a

rod laterally extending from the free end of the frame, an arm on the shaft of the drum of the carrying-off table, to engage the lateral rod and lift the roller from the notches in the rigid bar, substantially as set forth.

7. In a brick and tile cutting machine, the combination with a longitudinally-reciprocating carriage, a transversely-reciprocating cutting-frame thereon, mechanism for actuating the carriage and cutting-frame, and a trip actuated by the severed clay to bring into action the operating mechanism aforesaid, substantially as set forth.

8. In a brick and tile cutting mechanism, a carrying-table, comprising stationary standards provided with bearings in their upper ends, and formed with rearwardly-projecting and upwardly-curved arms, adjusting-screws in the ends of the said arms, a frame pivotally hung in the bearings of the standards, rollers journaled in the frame, a drum journaled in adjustable bearings in the free end of the frame, a main drum journaled in the forward end of the frame, and a carrying-apron on the drums and traveling over the rollers in the frame, substantially as set forth and for the purpose specified.

9. In a brick and tile cutting machine, the combination with a longitudinally-reciprocating carriage, and a transversely-reciprocating cutting-frame thereon, of a driving-shaft, a loose pinion thereon, a crank-shaft, a gear-wheel thereon in mesh with the said loose pinion, a pull-rod between the crank-shaft and the cutting-frame, a disk-wheel fixed on the driving-shaft, radially-arranged rollers laterally projecting from the disk-wheel, a pawl N, eccentrically fulcrumed on the loose pinion, and formed with a bifurcated hub loosely straddling the driving-shaft, and in the path of the rollers on the disk-wheel, an oscillating arm on which the free end of the arm N lodges, means to oscillate the said oscillating arm, a pull-rod having one end connected to the oscillating arm and the other end fastened to a crank-arm on a rotary rocking lever-rod, a laterally-projecting lever on the free end of the rotary rocking lever, the clay-actuated drum of the carrying-table, and a rotating arm on the shaft of drum, to engage and lift the projecting lever, substantially as set forth.

10. In a brick and tile cutting machine the combination with a longitudinally-reciprocating carriage, and a transversely-reciprocating cutting-frame thereon, of a driving-shaft, a loose pinion thereon, a crank-shaft, a gear-wheel L thereon in mesh with the loose pinion, a bar extending from the end of the crank, a sliding sleeve on said bar, a pull-bar connecting said sleeve to the cutting-frame, a disk-wheel on the driving-shaft, radially-arranged rollers projecting from the disk-wheel, a pawl N, eccentrically fulcrumed on the loose pinion, formed with a bifurcated hub loosely straddling the driving-shaft, and in the path of the rollers on the disk-wheel, a

pinion M, journaled to mesh with the gear-wheel L, an oscillating arm, a yielding connection between the arm and the pinion M, a pull-rod having one end connected to the oscillating arm and the other to a crank-arm on rotary rocking rod, a lever-bar projected laterally from the free end of the rotary rocking rod, and a clay-actuated rotating arm to lift the lever-bar, substantially as set forth.

11. In a cutting-table for brick and tile, the combination of the longitudinally-reciprocating carriage, tracks transversely laid and secured on the carriage, said tracks being formed with vertical flanges on their outer edges, and the tracks having apertured ears on their inner faces, the transversely-reciprocating cutting-frame, having end pieces with bottoms formed to fit on the face of the tracks and over the flanges thereof, and having a flange on their inner upper faces, a keeper-plate formed with a laterally-projecting flange to set over the inner flanges of the said end pieces, and having vertical sleeves thereon, fastening-bolts projected through the keeper-plates, and fastening-bolts in the said sleeves and ears, substantially as set forth.

12. An intermitting clutch-lock, comprising a rotatable shaft, a loose pinion thereon, a

pawl eccentrically fulcrumed on the loose pinion, and having a bifurcated hub loosely straddling the shaft, a disk-wheel fixed on the shaft, radially-arranged rollers projecting from the face of the disk in the path of one of the arms of the bifurcated hub, substantially as set forth.

13. An intermitting clutch-lock, comprising a rotatable shaft, a loose pinion thereon, a pawl eccentrically fulcrumed on the loose pinion and having a bifurcated hub, the arms of which loosely straddle the shaft, a disk-wheel fixed on the shaft, radially-arranged rollers projecting from the face of the disk in the path of one of the arms of the bifurcated hub, and a movable support actuated by the mechanism connected to the loose pinion, to intercept the free end of the eccentrically-fulcrumed pawl, substantially as set forth and for the purpose specified.

In testimony whereof we have hereunto set our hands this 6th day of March, A. D. 1896.

JOHN O. LUDLAM.
JOHN L. MCKITTRICK.

Witnesses:

W. K. MILLER,
BURT A. MILLER.