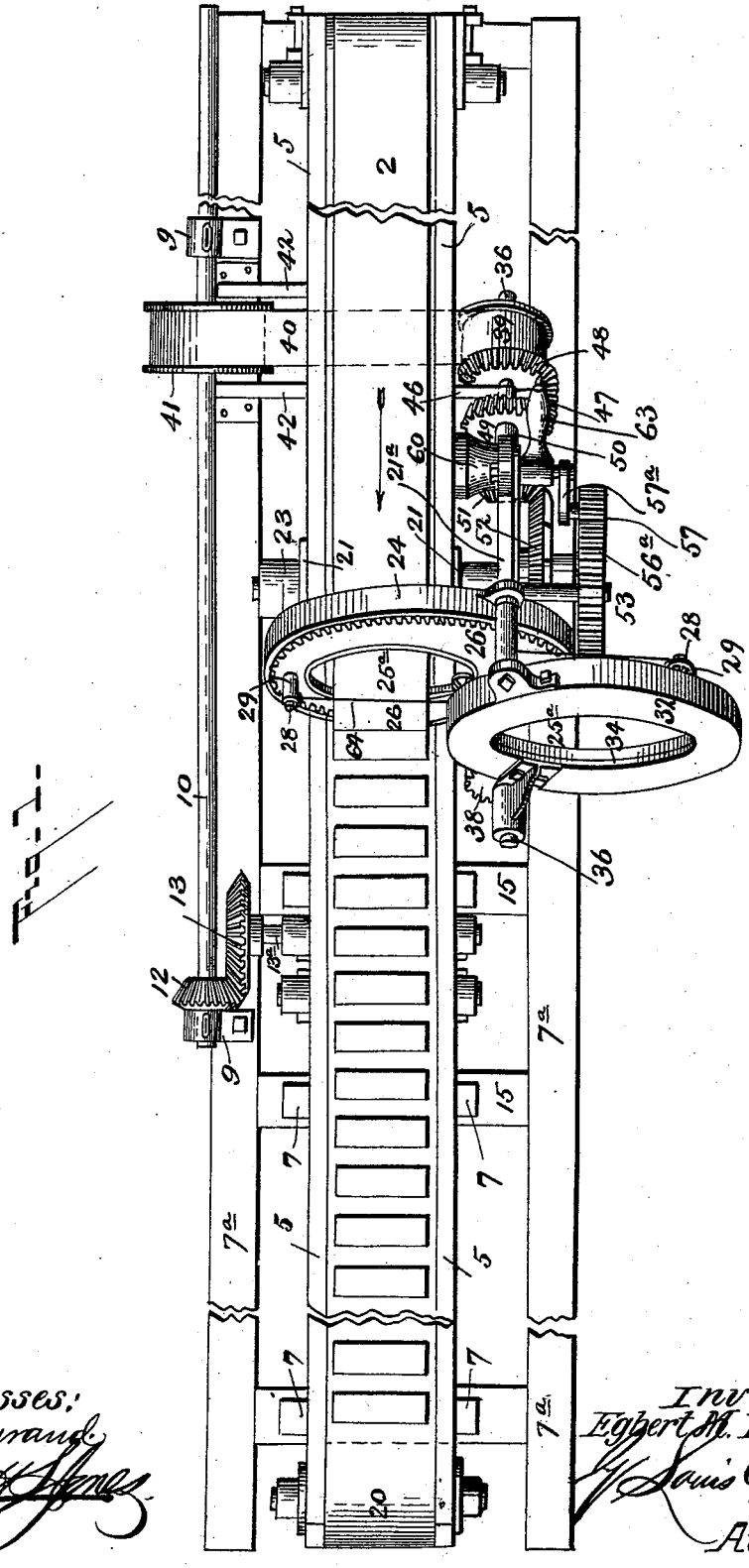
(No Model.) 4 Sheets—Sheet 1.

E. M. FREESE.

BRICK OR TILE MACHINE.

No. 507,798. Patented Oct. 31, 1893.



Witnesses:
F. L. Ourand.
Arthur Jones.

Inventor:
Egbert M. Freese,
by Louis Bagger & Co.
Attorneys.

(No Model.) 4 Sheets—Sheet 2.

E. M. FREESE.

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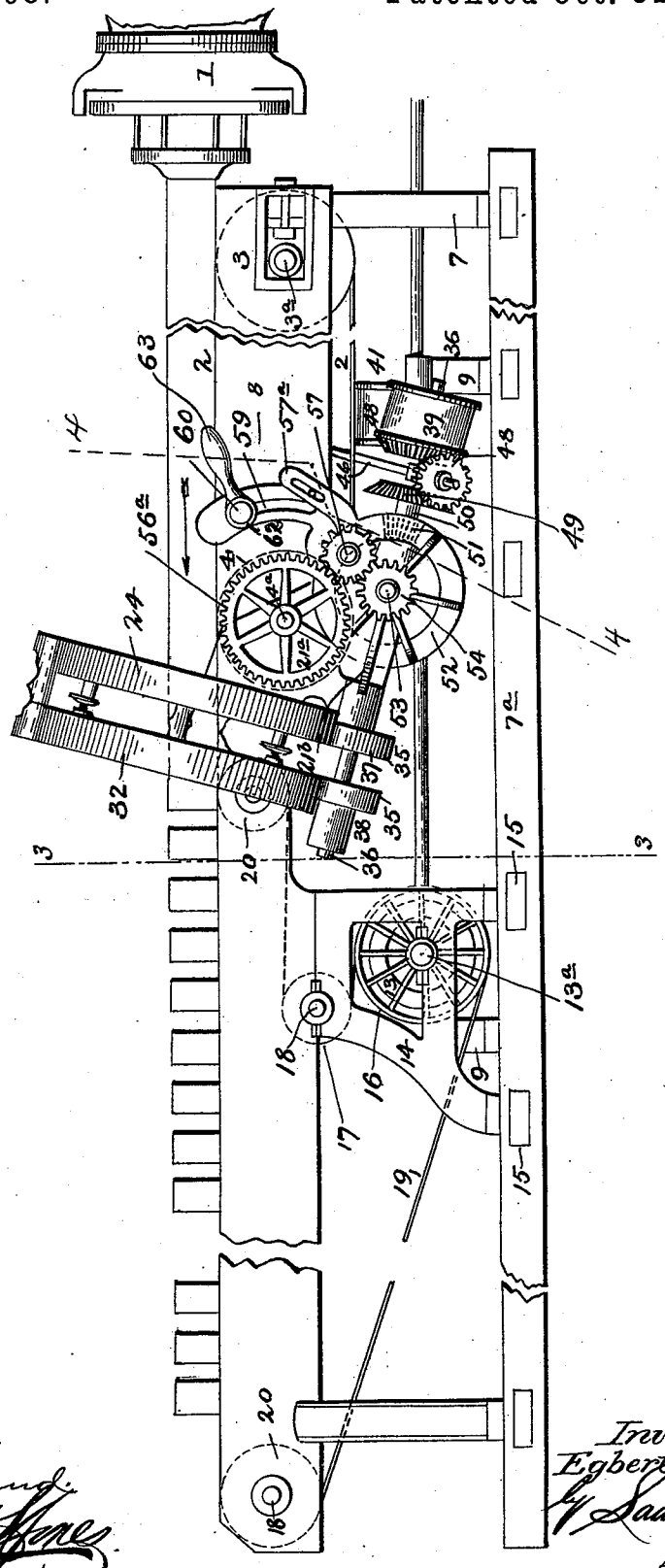

FIG. 2.

Witnesses:
F. L. Ourand.
Emmett Lane.

Inventor:
Egbert M. Freese,
by Louis Bagget
Attorneys.

(No Model.) 4 Sheets—Sheet 3.

E. M. FREESE.

BRICK OR TILE MACHINE.

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Fig. 3.

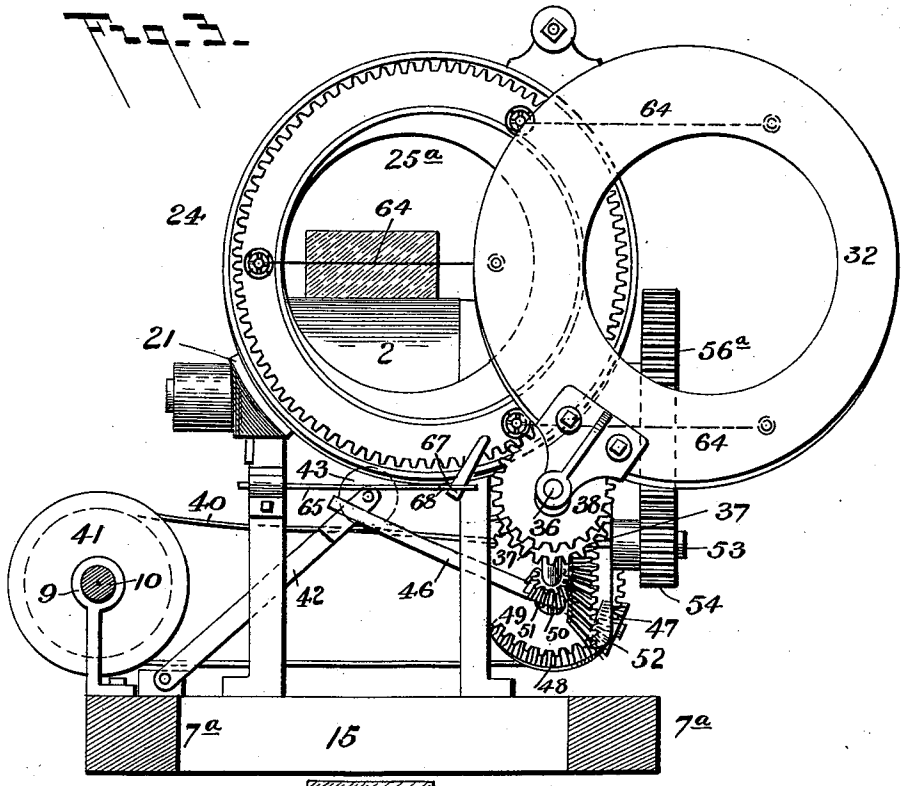
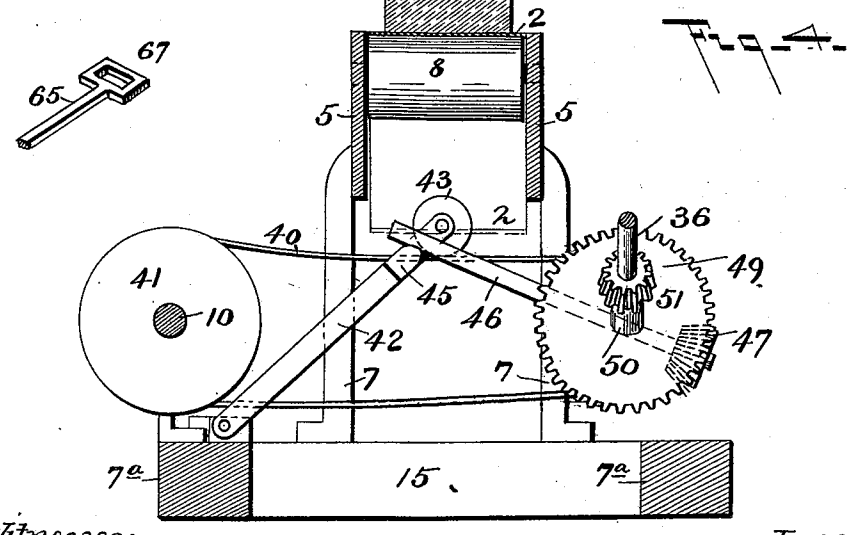


Fig. 4.



Witnesses:
F. L. Durand.
Emma L. Jones.

Inventor:
Egbert M. Freese,
by Louis Bagger & Co
Attorneys.

(No Model.) 4 Sheets—Sheet 4.

E. M. FREESE.

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Fig. 5.

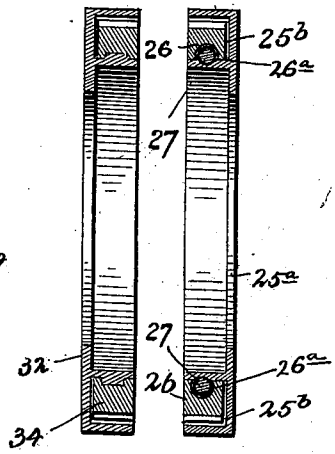


Fig. 11.

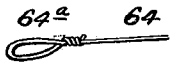


Fig. 10.

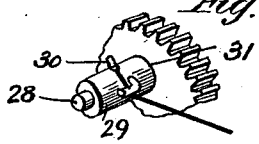


Fig. 7.

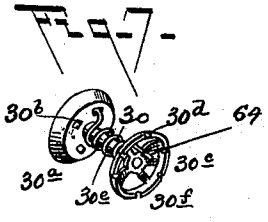


Fig. 8.

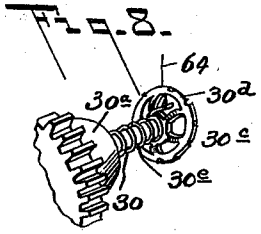
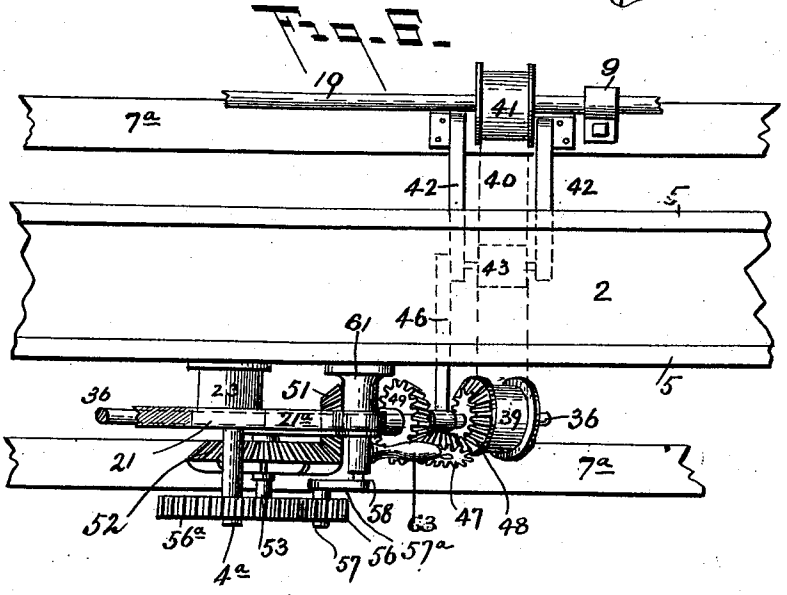


Fig. 6.



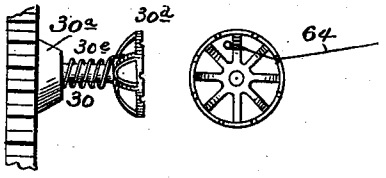


Fig. 9.

Witnesses:
F. L. Durand.
Emmet F. Jones.

Inventor:
Egbert M. Freese,
by Laws Dagger & Co
Attorneys.

UNITED STATES PATENT OFFICE.

EGBERT M. FREESE, OF GALION, OHIO.

BRICK OR TILE MACHINE.

SPECIFICATION forming part of Letters Patent No. 507,798, dated October 31, 1893.

Application filed January 25, 1893. Serial No. 459,713. (No model.)

To all whom it may concern:

Be it known that I, EGBERT M. FREESE, a citizen of the United States, and a resident of Galion, in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Brick or Tile Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to that class of brick or tile machines in which bricks or tiles are automatically cut from a moving column or bar of clay issuing from the die or dies of a clay working machine.

The prime object of my invention is to provide automatic cutting devices driven from the clay machine or other source of power, which act upon the column or bar of clay to sever the bricks or other objects therefrom.

It is also an object to provide improved frictional devices, whereby the speed of the cutting mechanism is governed and regulated by the speed of the moving column or bar of clay, any variation in the speed of the clay, causing a corresponding variation in the speed of the cutting mechanism.

There are other objects which will be apparent to those skilled in the art, and which need not be enumerated in detail.

The invention consists in the novel construction and combination of parts, hereinafter fully described and claimed.

In the accompanying drawings: Figure 1 is a plan view of a brick or tile machine, constructed in accordance with my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a cross section, on the line 3—3, Fig. 2. Fig. 4 is a cross section on the line 4—4, Fig. 2. Fig. 5 is a central vertical section through the cutter carrying rings; showing two modifications in the construction thereof. Fig. 6 is a plan view, showing means for driving the cutting mechanism. Figs. 7, 8 and 9, are detail views showing the means for regulating the tension of the cutting wires. Fig. 10 is a detail view showing the means for connecting one end of the cutting wires to the annuli. Fig. 11 is a view of the end of one of the cutting wires.

In the said drawings, see Figs. 1 and 2, the reference numeral 1 indicates the die of a clay working machine, and 2 the belt which receives the clay as it emerges from the die. This belt passes over pulleys 3 and 4, respectively, fixed to shafts 3^a and 4^a journaled in the front and rear ends of a table, consisting of side bars 5, flush with the upper surface of the belt and supporting legs or uprights 7, secured to the base 7^a. Intermediate of their ends, the side bars are provided with rollers 8, for supporting the belt, and preventing it from sagging. Journaled in bearings 9, secured to said base is a horizontal shaft 10, which is driven from some moving part of the clay machine, or other source of power, and carries at its rear end a bevel pinion 12, which meshes with a bevel gear 13, mounted upon a transverse shaft 13^a, journaled in frames 14, secured to the cross pieces 15, of the base 7^a. This shaft carries a pulley 16, Fig. 2 around which, and a smaller pulley 17, fixed to a transverse shaft 18, journaled in said frame above and at one side of said shaft 13^a, passes a belt 19 for conveying the cut bricks or other objects, away from the feeding belt 2. This belt also passes over pulleys 20, located at the front and rear ends of a table, similar to that which supports the feeding belt. This conveyer belt is located at the rear end of the feeding belt, so as to receive the bricks as they are cut.

Securely bolted to brackets 21, having hubs 23, which are journaled on the shaft 4^a of the rear pulley 4, see Figs. 1, 2, 3 and 4, is a casting 24 preferably circular in form and provided with an eccentric or other form of opening 25^a. This casting is located just in rear of the feeding belt, so that its opening will register with the moving column or bar of clay, as seen in Figs. 1 and 3. On its outer face, it is formed with a circular groove or recess 25^b, in which is located a rotatable annulus or ring 26 having a series of cogs upon its periphery. The meeting surfaces of the annulus and the casting are formed with semi-circular grooves 26^a to receive balls 27, see Fig. 5, forming ball bearings for the annulus, so as to reduce the friction to a minimum. Secured to the said annulus, see Fig. 10, is one or more studs or pins 28, upon which are mounted hubs or sleeves 29, having studs 30, and hooked lugs 31, with which the cutting wires engage.

Securely bolted to the casting 24, is a simi-

lar casting 32, having an annulus 34, Fig. 5. This casting, and its annulus, are exact duplicates of the casting and annulus before described, and further description is therefore not deemed necessary.

Journaled in bearings 35, formed in an extension 21^a, of one of the brackets 21, see Figs. 1, 2 and 6, to which the casting 24 is bolted, is an inclined shaft 36, having near its rear end two pinions 37 and 38, which mesh respectively with the cogs of the two annuli 26 and 34. This shaft at its opposite or front end, is provided with a pulley 39, which is connected by means of a loose belt 40, with a pulley 41, on the main shaft 10. See Figs. 1, 2, 3, 4 and 6.

Pivoted to the base 7^a, are two inwardly extending levers 42, one on each side of pulley 41, and provided at their inner or free ends with a tightening pulley 43, which rests upon the belt 40. See Figs. 3 and 4. One of the levers 42, at its inner end, is provided with a cleat 45, upon which rests one end of an inwardly extending lever 46, fulcrumed upon the shaft 36, the opposite or outer end of which is provided with a loose bevel-pinion 47, meshing respectively with a bevel gear 48, fixed to pulley 39, and a similar gear 49, fixed to a hub 50, loose upon the shaft 36. See Figs. 1, 2, 3, 4 and 6. This hub is provided with a bevel pinion 51, which meshes with a bevel gear 52, mounted upon a shaft 53, journaled in the extension 21^a and an extension 21^b, of the bracket 21. This shaft 53, at its outer end, is provided with a pinion 54, meshing with a pinion 56, fixed to a short shaft 57, journaled in a downwardly extending adjustable arm 57^a, secured to a hub 58, formed with the extension 21^a. This pinion 56, meshes with a cog wheel 55^a on the pulley shaft 4^a. The extension is also formed with a segmental slot 59, through which passes a stud 60, on a projection 61 secured to one of the side pieces of the feeding table. See Fig. 2. This stud is screw-threaded and provided with a binding nut 62, with handle 63, and its purpose is to allow the angle or inclination of the castings 24 and 32, with respect to the moving column of clay, to be varied Figs. 1, 2 and 6.

The numeral 64, designates the cutting wires, three being shown in the present instance. One end of these wires, is formed with a loop 64^a Fig. 11 which engages with the studs 30 Fig. 10 of the sleeves 29 and passes under the hooked lugs 31. The wire is then carried over to an aligned stud 30 Figs. 7, 8 and 9 in the other annulus, provided with a hub 30^a having a series of recesses or slots 30^b and a hand-wheel 30^c, having a series of notches 30^d in its face. Encircling this stud 30, is a coiled spring 30^e one end of which is bent and engaged in one of the slots 30^b, while the other end passes through openings in the hand-wheel, and is connected with the cutting wire, a washer 30^f and key 30^g, holding the said wheel in place. It will be noted that the wire engages with one of the notches in the hand-wheel, thus preventing the hub from turning, the coiled spring regulating the tension of the wire.

Secured to a bracket, on one side of the feeding table, see Fig. 3, is an inwardly extending spring arm 65, having a loop 67, at its inner or free end and carrying a wooden block 68, which lies in the path of the wires during their movement, and serves to clear the same from any dirt that may be adhering thereto.

Before describing the operation in detail, it should be stated that the castings and annuli, must be inclined at an acute angle to the path of travel of the column of clay, as if they were perpendicular, or at right angles thereto, an angular cut would be made, owing to the movement of the clay. It should also be stated, that the cutting mechanism should be so timed, as to rotate or move at a certain rate, with relation to the moving clay and means provided, so that when the speed of the clay increases or decreases, the speed of the cutting devices must be correspondingly varied, as otherwise, the bricks cut, would not be of uniform thickness, and the cut would not be perfectly straight. Bearing these statements in mind, the operation is as follows:

The clay machine being set in motion, the shaft 10, will actuate the shafts 36 by means of belt 40 and pulleys 39 and 41, causing the annuli or rings to be rotated at a rate of speed proportioned to a certain rate of speed which the column of clay should travel from the die of the clay machine, such speed being regulated by the tightening pulley. As the clay emerges from the die onto the feeding belt, it will engage therewith by frictional contact, and cause the same to move in unison therewith. This movement of the belt will rotate the cog-wheel 56^a on the pulley shaft 4^a, and through the medium of pinions 56, 54, the bevel gear 52, and pinion 51, will rotate the bevel gear 49 on loose hub 50 at the same speed as that of gear 48 fixed to the pulley 39, of shaft 36, but in an opposite direction. So long as these two gears 48 and 49, rotate at the same speed, the pinion 47 will rotate on lever 46, without moving the same on its fulcrum, and thus causing the tightener pulley to, (by gravity,) bear upon belt 40, and the cutting mechanism to be driven at the proper speed. The clay will now pass to the cutting wires and be severed by the rotation of the annuli or rings carrying the same, into bricks or other objects. Should, however, the feed of the clay column or bar increase or decrease from any cause, the movement of the feeding belt would be increased or decreased accordingly, causing a corresponding increase or decrease in the speed of cog-wheel 56^a, and consequently of the bevel gear 49. The speed of said pinions 48 and 49 being varied, the pinion 47 will be forced either upwardly or downwardly, turning lever 46, on its fulcrum and causing the tightener pulley to bear with

more or less pressure on the belt 40, and the latter to bind tighter or looser on the pulley 41. If the clay and feeding-belt be traveling too fast, the feed of the pinion 49, will be accordingly increased, and run at a higher rate than pinion 48. These two pinions now moving at different rates will cause the lever 46 to turn on its fulcrum in the direction of the least resistance of the pinion 47 on the end thereof. In this instance, the pinion 49, traveling the faster, the resistance would be less in the direction of its rotation and the inner end of the lever will be depressed causing the tightener pulley to bear with greater pressure on the belt, which will then be caused to bind more tightly on pulley 39, and the speed of shaft 36 be increased until pinions 48 and 49 again rotate at the same speed. If, on the contrary, the speed of the feeding belt decreases, a reverse movement will be given to lever 46, easing the tightener pulley, and allowing the belt to slip on pulley 39 and its speed decreased. As the bricks are cut from the bar of clay, they pass onto the conveyer belt.

I have described the castings and their annuli or rings as being duplicates of each other, but it is obvious that the outer casting and its annulus may be dispensed with, and an ordinary wheel or even a crank be substituted therefor, with which the cutting wires may be connected. In fact, any suitable device may be substituted therefor, which will accomplish the essential object of the invention, which is to give to the cutting wires a combined transverse and vertical movement down through the bar of clay, and then around out of the path thereof, and up over the same to make a new cut. I have also illustrated the axis of the annuli or rings as being in a horizontal plane, but it is obvious that the plane thereof, may be at an angle to the line of travel of the clay, without departing from the invention.

In the modification of the annulus 34, and casting 32, the friction balls are dispensed with and a groove and flange provided as in the ordinary eccentric and its strap for actuating the valve of a steam engine. See Fig. 5.

Having thus described my invention, what I claim is—

1. In a brick machine of the character described, the combination with a conveyer, of two rotatable carriers, one of which has an opening coinciding with said conveyer, and a horizontal cutting wire moving transversely across and above and below the path of a column of clay carried by said conveyer, substantially as described.

2. In a brick or tile machine, the combination with a clay feeding mechanism, of two rotatable annuli, and a cutting wire connected therewith.

3. In a brick or tile machine, the combination with the clay feeding mechanism, of a rotatable annulus having an opening coinciding with the line of travel of the clay fed by said mechanism, a cutting wire connected with said annulus, and a movable device with which said wire is also connected.

4. In a brick or tile machine, the combination with a clay feeding mechanism, of a rotatable annulus having an opening coinciding with the line of travel of the clay fed thereby, a cutting wire secured to said annulus and to a second annulus moving in unison therewith.

5. In a brick or tile machine, the combination with a clay feeding mechanism, of the parallel rotatable annuli or rings, and the cutting wires connected therewith.

6. In a brick or tile machine, the combination with a clay feeding device, a casting having an opening coinciding with the line of travel of the clay and an annular groove, an annulus seating and rotating in said groove, and a cutting wire secured to said annulus, of a casting secured to said first-named casting having a rotatable annulus to which the opposite end of said cutting wire is connected.

7. In a brick or tile machine, the combination with a feeding belt, the shaft and pulleys over which the belt passes the gear on one of said shafts and the pinions and gear connected therewith, of the rotatable annuli and the cutting wires connected therewith, the shaft having pinions meshing with said annuli, the loose hub on said shaft having a bevel pinion, and gear, the pulley and gear fixed to said shaft, the lever fulcrumed on said shaft and having a loose bevel pinion, the tightener pulley, the loose belt and means for actuating said belt, substantially as described.

8. In a brick or tile machine, the combination with the rotatable annuli, one of which is provided with studs on its faces, and provided with a hub having openings therein, of the hand-wheel having notches in its face, rotatable upon one of said studs, and having a slot therein, a spring coiled upon said stud having one end engaging with said recessed hub, and the other end passing through the openings in the wheel and adapted to engage with a cutting wire, substantially as described.

9. In a brick or tile machine, the combination with a clay feeding mechanism, the two rotatable annuli and a cutting wire connected with said annuli, of the inwardly extending spring arm secured at one end to the frame of the machine and carrying a scraper at its free end, substantially as described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

EGBERT M. FREESE.

Witnesses:
B. E. PLACE,
M. B. WINELAND.