S. E. DRUMMOND.

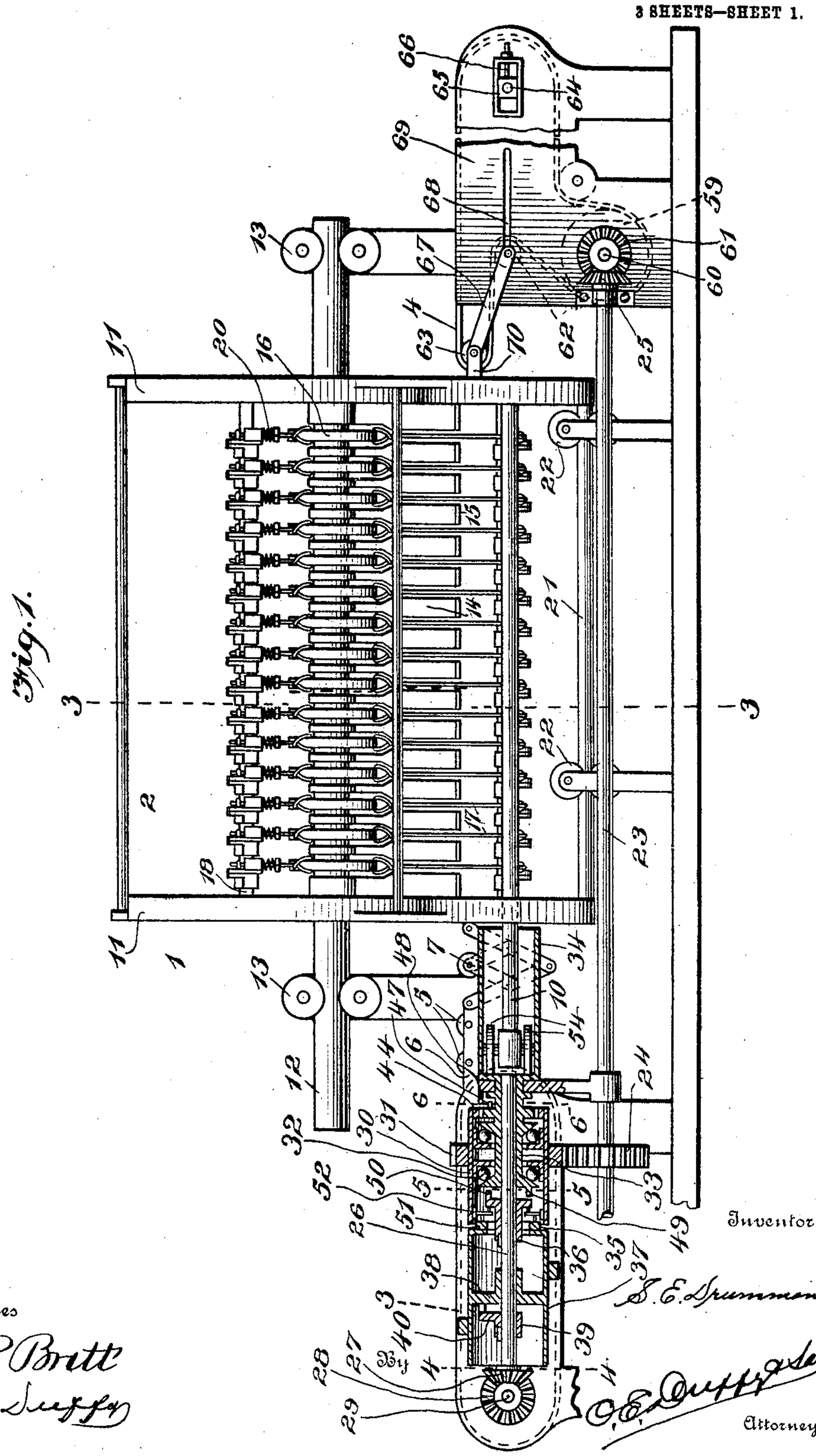
BRICK MACHINE.

APPLICATION FILED JULY 10, 1907.

924,972.

Patented June 15, 1909.

3 SHEETS—SHEET 1.



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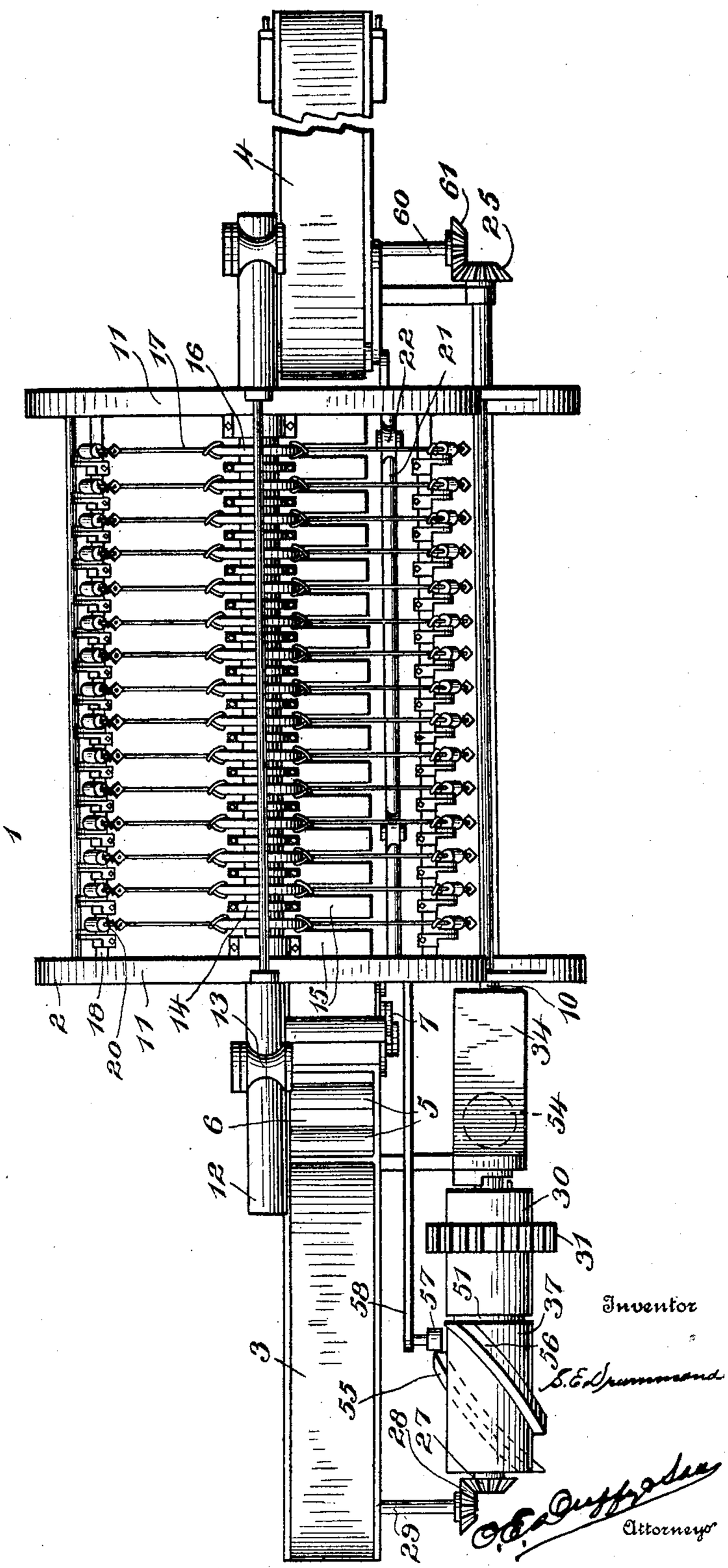
3 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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3 SHEETS—SHEET 3.

Fig. 3.

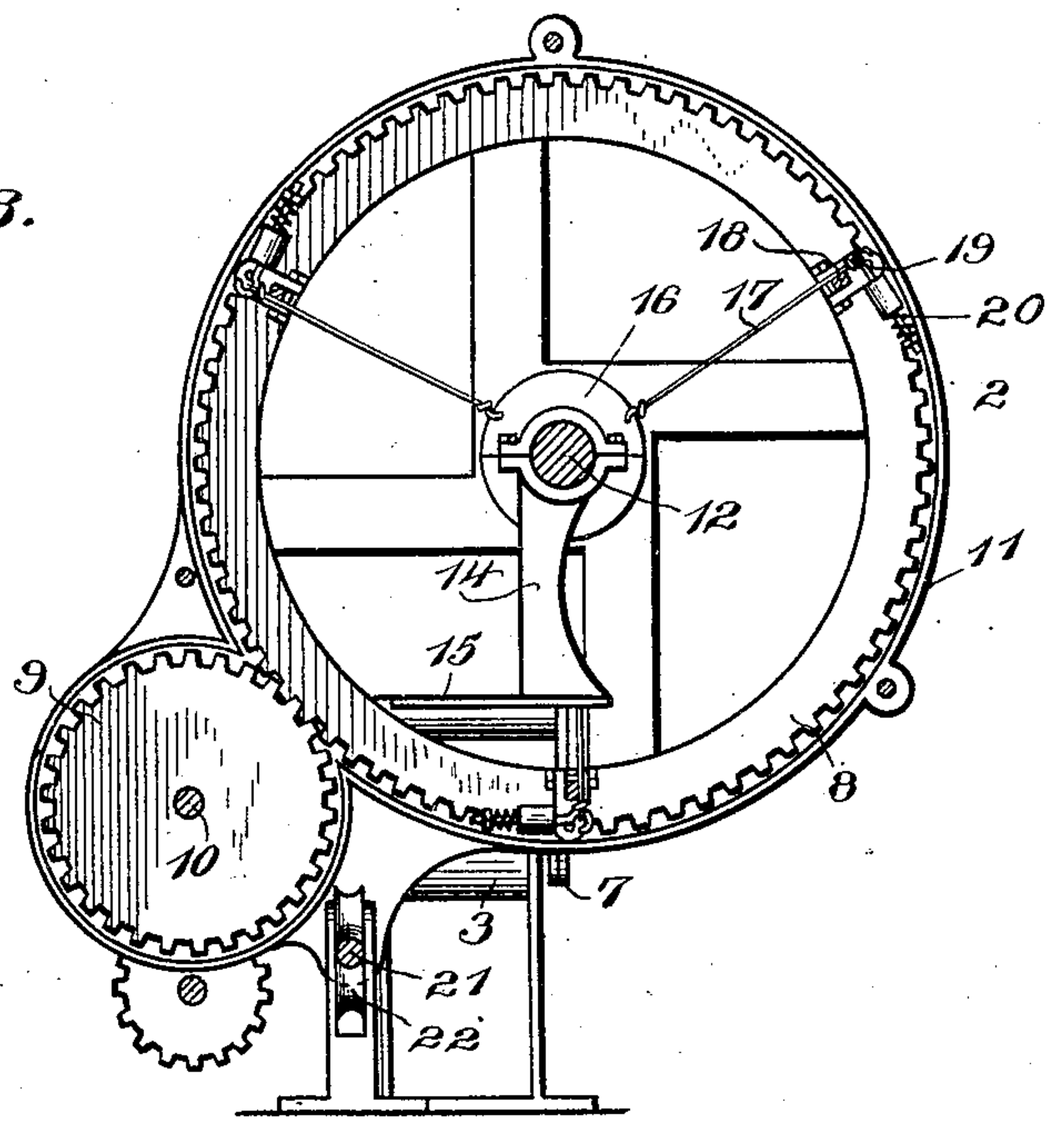


Fig. 4.

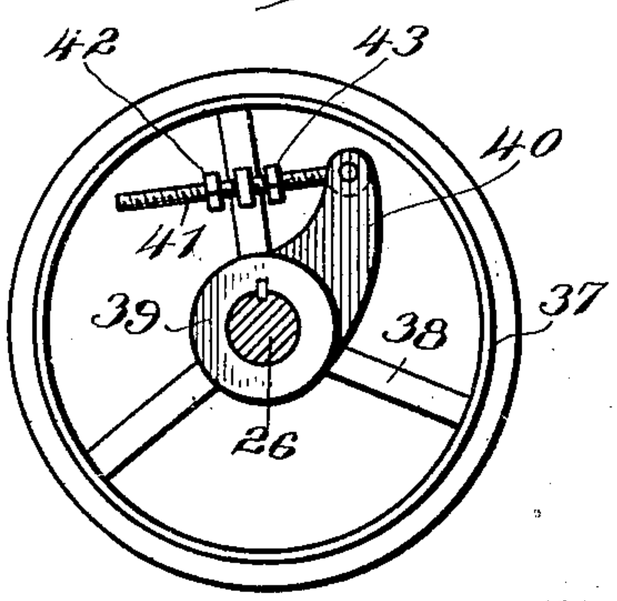


Fig. 5.

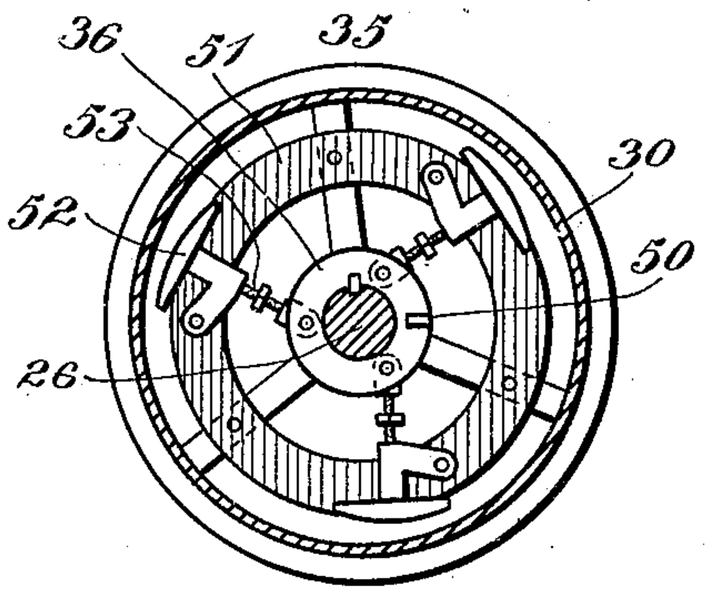


Fig. 6.

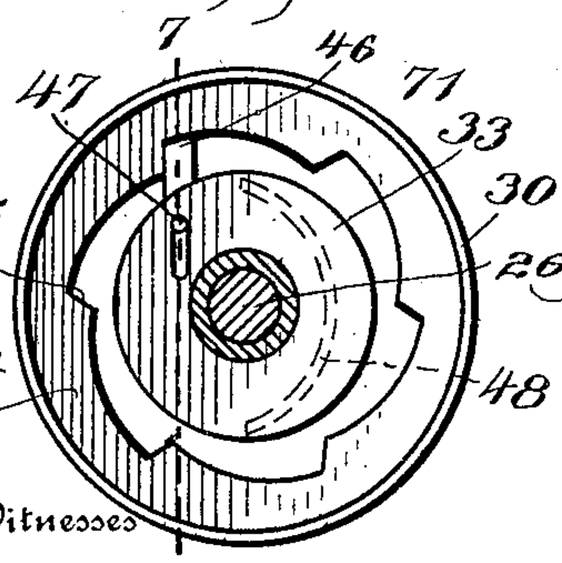


Fig. 7.

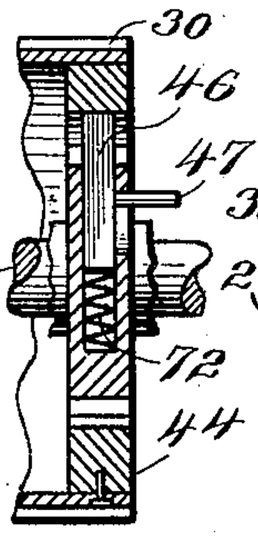
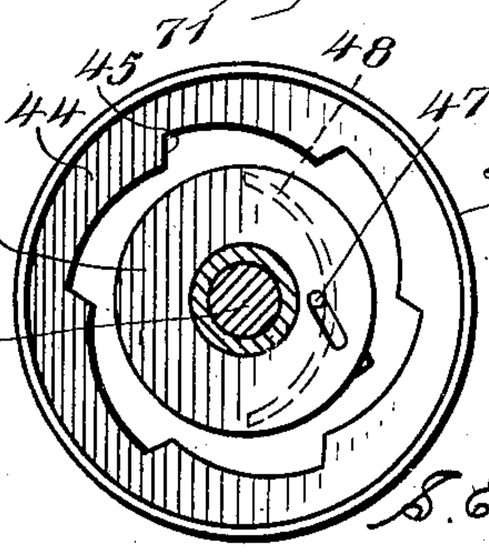


Fig. 8.



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UNITED STATES PATENT OFFICE.

SHERIDAN E. DRUMMOND, OF PARKERSBURG, WEST VIRGINIA.

BRICK-MACHINE.

No. 924,972. Specification of Letters Patent. Patented June 15, 1909.

Application filed July 10, 1907. Serial No. 383,046.

To all whom it may concern:

Be it known that I, SHERIDAN E. DRUMMOND, a citizen of the United States, residing at Parkersburg, in the county of Wood and State of West Virginia, have invented certain new and useful Improvements in Brick-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to brick machines and has for its object to provide a machine for cutting bricks from a column of clay.

With this object in view my invention consists in the employment of an automatic friction clutch requiring no setting other than motion of the column of clay, and so arranged that the motion imparted by the column of clay for operating the mechanism is automatically shifted to the applied outside power.

My invention also consists in the construction of this friction clutch which is so arranged that it can be set in the ordinary way or thrown entirely out of use without in any way interfering with the other motions of the machine.

My invention also consists in the construction for operating the cutting reel which enables the cutting mechanism to accommodate itself to the speed of the column of clay, thereby making it possible to employ this device with less jarring of machinery than if the reel had power applied to it while the machine is not in motion.

My invention also consists in the arrangement with an off-bearing belt which relieves the column from shoving the cut brick over a long apron, thereby reducing the liability of the cut brick being jammed together or mis-shaped while being delivered on the belt.

My invention also consists in the construction of the mechanism providing for ready access and removal of any or all of the parts.

My invention also consists in the arrangement of the parts of the operating mechanism to one side of the cutting mechanism, thereby removing the same from the liability of becoming clogged with dirt which is thrown down by the wires passing through the column of clay.

My invention also consists in the construction of the positive clutch which is particularly simple, strong, durable and efficient.

My invention also consists in the construction and arrangement of the parts in such manner that there is little or no liability for the machine to become out of alinement.

My invention also consists in certain other novel details of construction and in combinations of parts, all of which will be first fully described and afterward specifically pointed out in the appended claims.

Referring to the accompanying drawings: Figure 1 is a view of the machine partly in side elevation and partly in vertical section. Fig. 2 is a top plan view of the machine. Fig. 3 is a vertical transverse sectional view taken on line 3—3 of Fig. 1. Fig. 4 is a vertical sectional view taken on line 4—4 of Fig. 1 showing the construction for adjusting the automatic friction clutch. Fig. 5 is a vertical sectional view taken on line 5—5 of Fig. 1 illustrating the automatic friction clutch. Fig. 6 is a vertical transverse sectional view taken on line 6—6 of Fig. 1 showing the positive clutch in operative position. Fig. 7 is a vertical longitudinal sectional view through the clutch taken on line 7—7 of Fig. 6, and Fig. 8 is a view illustrating the positive clutch out of engagement.

Like numerals of reference indicate the same parts throughout the several figures in which:

1 indicates the machine comprising the cutting reel 2, measuring table belt 3 and off-bearing belt 4. Arranged between the measuring table belt 3 and the cutting reel 2 are two rollers 5 arranged in an oil pan 6 (Fig. 2) and lazy tongs 7. The cutting reel 2 comprises at one end thereof a large gear wheel 8 meshing with a smaller gear wheel 9 carried on the shaft 10, a casing 11 incasing these two wheels as shown in Figs. 1 and 3.

12 indicates the axle or journal upon which the rings or flanges 16 rotate, said journal 12 being supported at each end thereof in a pair of rollers 13 as shown in Fig. 2 in order to allow the said axle or journal 12 a free reciprocating movement. Secured to the shaft or journal 12, as shown in Figs. 1 and 3, are a series of depending fingers 14 having formed at the lower end thereof a hori-

zontal shelf 15 to receive the column of clay. Journaled on the axle 12 between each of the depending fingers 14 is a ring or flange 16 to which is secured the inner ends of the cutting wires 17 as clearly shown in Fig. 3.

18 indicates the cross pieces which extend across the reel against which the outer ends of the cutting wires 17 engage. A hook 19 for each wire having a coil spring 20 thereon is preferably employed as shown in Fig. 3 for taking the shock from the cutting wires while they are acting upon the column of clay. Located at the bottom of the reel is a guide rod 21 supported at each end thereof by a pair of rollers 22 in order to allow the said rod a free reciprocating movement.

23 (Fig. 1) indicates the driving shaft having on one end thereof a gear wheel 24 and at the other end thereof a bevel pinion 25.

26 indicates the clutch shaft which as shown in Fig. 1 is provided at its outer end with a bevel pinion 27 in mesh with a tooth pinion 28, said pinion 28 being carried on the shaft 29 of the measuring table belt drum. Loosely carried on the shaft 26 is a drum 30 to which is secured a gear wheel 31 in mesh with the gear wheel 24 on the drive shaft 23, said drum 30 being free to rotate on the ball bearings 32.

33 indicates a spool loosely carried on the shaft 26 to which spool is also connected the square open end case 34. Carried on the shaft 26 within the drum 30 is a clutch 35 shown in detail in Fig. 5, a sleeve 36 of said clutch being securely keyed or otherwise secured to the shaft 26. Carried also on the shaft 26 is a drum 37 having web or spokes 38 (Fig. 4) and keyed to said shaft within the drum 37 is a sleeve 39 having an arm 40 carrying a threaded bolt or pin 41, which bolt or pin 41 is in engagement with one of the spokes or web 38 of the drum 37 as shown in Fig. 4, two nuts 42 and 43 on said threaded bolt or pin providing for the adjustment of said bolt or pin on the spoke or web 38. Carried on the inner end of the drum 30 is a disk 44 formed with ratchet teeth 45 (Figs. 6 and 8), while a pawl or bolt 46 is carried in the spool 33, said pawl or bolt being provided with an extending pin 47 for engagement with a cam 48, shown in dotted lines in Figs. 6 and 8. On the outer end of the spool 33 is a projection 49 for engagement with a lug or projection 50 on the clutch 35. Carried on the drum 37 is a ring 51, to which ring 51 are pivoted the clutch dogs 52, said dogs being also connected to the keyed collar 36 of the clutch 35; a right and left threaded bolt 53 being provided for each of the clutch dogs 52 for the purpose of adjusting the same, as clearly shown in Fig. 5. Within the open end case 34 the shaft 10 of the gear wheel 9 extends and on the end of said shaft is provided two rollers 54 arranged to reciprocate within said case. Carried on the outside of the drum 37 is a section of a right and left spiral 55 and 56; in engagement with these sections is a roller 57 carried on the rod 58 which is connected to the reel 2.

Referring to the off-bearing belt 4 it will be seen from Fig. 1 that said belt passes around a drum 59, shown in dotted lines, the shaft 60 of said drum carrying a bevel pinion 61 in mesh with the bevel pinion 25 on the drive shaft 23, said belt passing from this drum 59 passes over a small roller 62 and over a small roller 63 at the forward end of the belt, passing rearwardly over a large drum having a shaft 64 arranged in the slide tongs 65 which is adjustable by means of a pin or bolt 66. A link 67 connects the two rollers 62 and 63 holding them always at a uniform distance apart, while a slot 68 in the casing 69 provides for a free reciprocating movement of the roller 62; the forward roller 63 is connected to the reel 2 by means of a lug or projection 70 as clearly shown.

Referring again to the positive clutch 71 illustrated in Figs. 6, 7 and 8 it will be seen that the pawl 46 is actuated by a spring 72 to hold same in engagement with the ratchet teeth 45; however this pawl 46 can be actuated by gravity if desired.

Having thus fully described the several parts of my invention its operation is as follows: The column of clay to be operated on to be cut into bricks passes onto the measuring table belt 3 causing the belt drum to rotate the bevel pinion 28 on the shaft 29 thereon, communicating this motion to the shaft 26. The sleeve 36 of the clutch 35 rotates with the shaft and the projecting pin or lug 50 on said sleeve engages with the pin or lug 49 on the spool 33, said pins or lugs being in engagement the spool 33 is rotated with the shaft, and as the pawl 46 (Fig. 6) of the positive clutch is carried on said spool 33 and as said pawl 46 is in engagement with one of the ratchet teeth 45 of the drum 30, said drum rotates with the shaft 26 and as the square open end case 34 is connected to the spool 33 said case rotates with said spool which also rotates the shaft 10 of the small gear wheel 9 (Fig. 3) thereby imparting motion to the reel 2. As the positive clutch 71 is rotated to a certain point the projecting pin 47 (Fig. 6) strikes the cam 48 (Fig. 8) drawing the pawl 46 out of engagement with its ratchet teeth 45 as shown in Fig. 8, thereby throwing the clutch out of gear and stopping the reel. It will be seen from the description of this operation that the action of the clutches is governed by the motion of the column of clay on the measuring table belt 3. As soon, however, as the clutch 35 (Fig. 5) is in engagement as just described the drum 30 is locked to and rotates with the shaft 26, the

shaft therefore taking power from the drive shaft 23 through the medium of the gear wheel 24 thereon and the gear wheel 31 on the outside of the drum 30 as shown in Fig. 1. As soon as the projecting pin 47 of the positive clutch 71 (Fig. 8) passes off of the cam 48 the pawl 46 again engages one of the ratchet teeth 45. While the pawl 46 is out of engagement with one of the ratchet teeth 45, as above described, the drum 30 is being rotated by the drive shaft 23 at a much higher rate of speed than the column of clay would produce if said drum were being rotated by the shaft 26. The positive clutch 71 being thrown in gear after the pin 47 passes the cam 48 the spool 33 is locked with the drum 30, thereby causing the open end case 34 to rotate the shaft 10 and to be driven by the power shaft 23 to rotate the reel 2 causing the cutting wires 17 to pass through the column of clay cutting the same into bricks, it of course being understood that the column of clay passes from the measuring table belt 3 over the rollers 5 and also tongs 7 onto the shelves 15 within the cutting reel, said reel and cutting wires rotating through the bar until the pin or extension 47 of the positive clutch 71 (Fig. 8) strikes the cam 48 withdrawing the pawl 46 and stopping further rotation of the reel. As the speed of the drum 30 driven by the power shaft 23 was greater during this operation than the speed of the shaft 26 which is rotated by the column of clay the pins or extensions 49 and 50 on the automatic clutch 35 (Fig. 5) are moved out of engagement, and as the positive clutch 71 (Fig. 8) has been thrown out of gear by means of the cam 48 the cutting reel is brought to a stop. The column of clay, however, continues to move over the measuring table belt 3 continuing to rotate the shaft 26, which shaft rotates freely within the parts until the pins or projections 49 and 50 are again brought into engagement again starting the cutting reel 2 and carrying the spool 33 of the positive clutch 71 around to the point where the pawl 46 again engages one of the ratchet teeth 45 at which point the power of the driving shaft 23 is again connected to the drum 30, square open end case 34 and shaft 10, so that the rotation of the cutting reel is assured positively by the power shaft 23 relieving the clay driven shaft of this work.

Having thus fully described the construction for driving the cutting reel and the manner in which the clutch throws on and off the power of the driving shaft 23, I will now describe the means for causing the reel to travel along with the column of clay while the cutting wires are being passed through, and the arrangement for returning the reel to the starting point after the wires have passed through the clay. Referring to the drum 37 (Fig. 2) it will be seen that the section of a right and left spiral 55 and 56 are arranged on the exterior of said drum; these spiral sections engaging with the roller 57, said roller is forced in one direction by the right spiral and in the opposite direction by the left spiral, and by means of the rod 58 which is connected to the reel the said reel is reciprocated traveling on the rollers 13 and 22, the drum 37 being in engagement with the keyed sleeve 39 on the shaft 26 rotates with said shaft, which shaft is driven by the column of clay for the reason that the speed of the reel must be uniform with that of the column of clay so that the cutting wires in passing through the clay must not move longitudinally in relation to the column of clay, otherwise the clay would be injured and the cuts would not be clean and straight. For this reason the positive power delivered by the drive shaft 23 cannot be employed for moving the cutting reel on account of the fact that the speed of the column of clay cannot be determined as it varies constantly. In order, however, that the power required of the column of clay may be as light as possible to do this work, and in order that no undue backward pressure is produced on the column of clay which would result in swelling and doubling of the column making an uneven brick and jamming together the bricks that have been cut, I have provided the automatic clutch 35 (Fig. 5). The operation of this clutch in connection with the foregoing operation of the parts is as follows: The sleeve 36 of the clutch 35 which is keyed on the shaft 26 and one end of each of the clutch dogs 52 are connected together as clearly shown in Fig. 5; while the clutch dogs 52 are also pivoted to the ring 51 carried on the spiral section drum 37. As the spiral section drum 37 is not rigidly connected to the shaft 26 it can be readily seen that in case of any resistance to this drum turning when its spiral sections are delivering power to move the reel the shaft 26 carrying the clutch 35 would continue to rotate the spiral section drum 37 on account of the fact that the clutch dogs 52 are secured to the spiral section drum 37. This slight rotation of the shaft 26 within the spiral section drum 37 causes the clutch sleeve 36 (Fig. 5) to rotate with relation to the ring 51 on the spiral section drum 37, which rotation drives the clutch dogs 52 outwardly to engage the power driven drum 30, thus transferring the power for moving the reel from the spiral section drum 37 to the power driven drum 30 and throwing the work on the power shaft 23, thereby relieving the column of clay from the work of moving the reel. Thus it will be seen that while the entire mechanism is controlled by the motion of the column of clay the only work it has to do is to set the automatic clutch 35, and as the power required for this operation can

be greatly compounded the back pressure on the column of clay is inconsiderable. Should the resistance in moving the reel be great the clutch sets hard and if the resistance be light the clutch sets proportionally, in fact the clutch is entirely strictly automatic and operates according to the resistance. However by the adjusting device shown in Fig. 4 the collar 39 being keyed to the shaft 26 and the threaded bolt being connected to the web or spoke 38 of the drum 37 by adjusting the nuts 42 and 43 in or out on the bolt 41 the automatic clutch 35 can be adjusted to set as hard as desired; or by reversing the direction in which the nuts are moved the clutch can be held out of use all together, in which event the work of moving the reel would be thrown entirely upon the column of clay.

As the driving mechanism just described does not travel, and as the reel and the shelves 15 or carriage must travel while being rotated, I provide the rollers 54 within the square open end case 34, as the square open end case 34 is rotated to turn the shaft 10, said shaft 10 and wheels 54 are free to move backwardly and forwardly within the case 34 with little or no friction.

As the off-bearing belt 4 is connected to the reel 2 by the parts before described, said belt follows the movement of the carriage, thus relieving the column from all back pressure as the belt always keeps the same position relative to the reel, traveling back and forth with it and thus obviating the use of the long apron over which the cut brick would have to be shoved, which operation obviously produces back pressure on the column.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a brick machine, the combination of a traveling carriage, a series of cutters thereon, an apron for carrying a column to be cut to said cutters, and an off-bearing belt for receiving the cut brick from said carriage, a series of rollers over which said off-bearing belt passes, one of said rollers being connected to said carriage, a link connecting said roller to a similar roller in such manner that two rollers follow the movement of said carriage, thereby lengthening and shortening the receiving surface of said off-bearing belt, substantially as described.

2. In a brick machine, the combination of a traveling carriage, a series of cutters thereon, an apron for receiving a column to be cut, a drum for said apron, a spiral section drum rotated by a shaft, a connection between said spiral section drum and said traveling carriage, a drum loosely carried on said shaft, a power shaft for rotating said drum, a spool carried on said shaft, a clutch on said spiral section drum for engagement with said last mentioned drum, a rotatable casing rotated with said spiral section drum, a shaft within said casing and rotated therewith for rotating the cutters, and means for disengaging said clutch from its drum to stop the rotating of said cutters, substantially as described.

3. In a brick machine, the combination of a traveling carriage, cutters thereon, an apron to receive a column to be cut, said apron being arranged to be moved by said column, a shaft rotated by said apron and column for moving said carriage at the same rate of speed with said column, a power shaft and casing rotated thereby, a shaft within said casing and rotated therewith for rotating said cutters, rollers carried on said last mentioned shaft to allow said shaft to reciprocate within said casing while being rotated, substantially as described.

4. In a brick machine, the combination of a traveling carriage, cutters carried thereon, an apron for receiving a column to be cut, said apron being arranged to be moved by said column, a shaft rotated by said apron and column, a spiral section drum on said shaft for reciprocating said carriage, a power shaft, a clutch operated by the movement of said apron for transferring the power for reciprocating said carriage from said apron to said power shaft, a shaft for rotating said cutters, a clutch operated by said first mentioned shaft for communicating the power from said power shaft to said shaft for rotating the cutters, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

SHERIDAN E. DRUMMOND.

Witnesses:

ELZA CALVIN,

JAY THOMAS.