

No. 675,825.

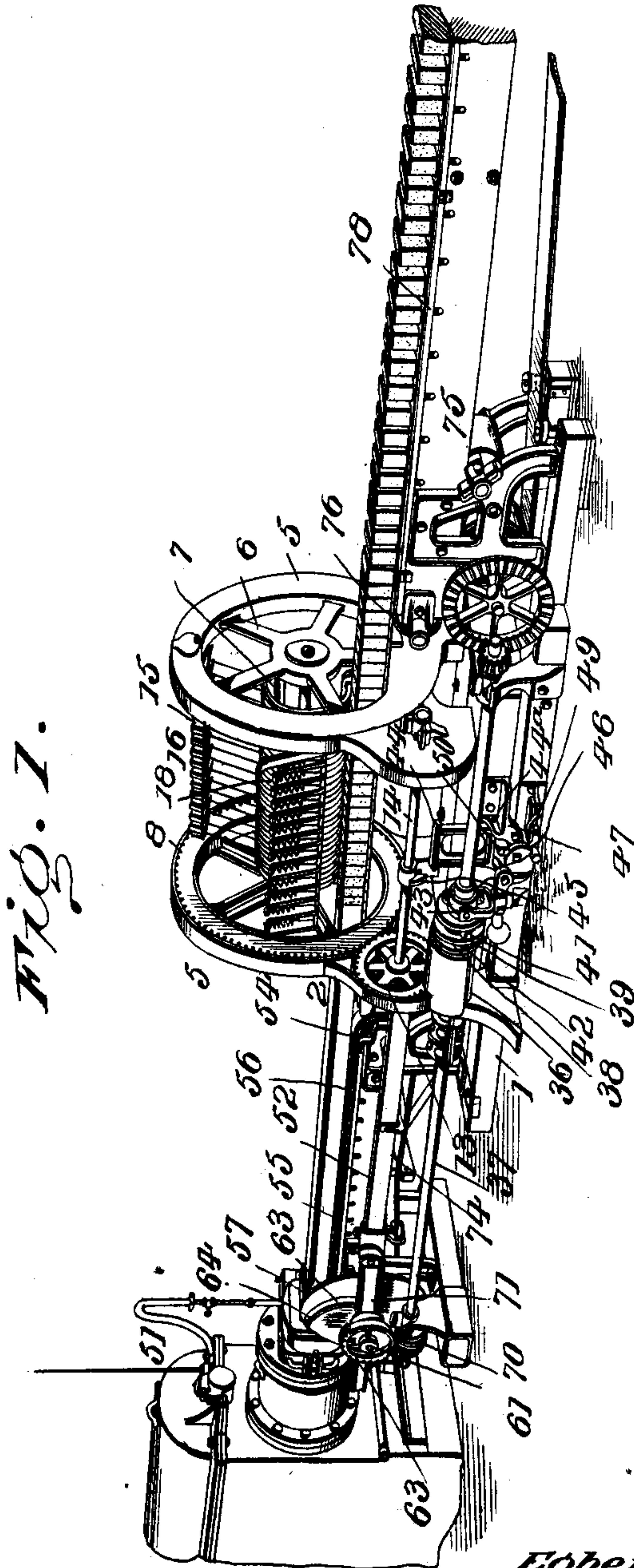
Patented June 4, 1901.

E. M. FREESE.  
BRICK AND TILE CUTTING MACHINE.

(Application filed Dec. 21, 1900.)

(No Model.)

6 Sheets—Sheet 1.



Inventor  
Egbert M. Freese

Witnesses  
J. M. M. M.  
H. L. L. L.

384

A. M. M. M.  
Attorney

No. 675,825.

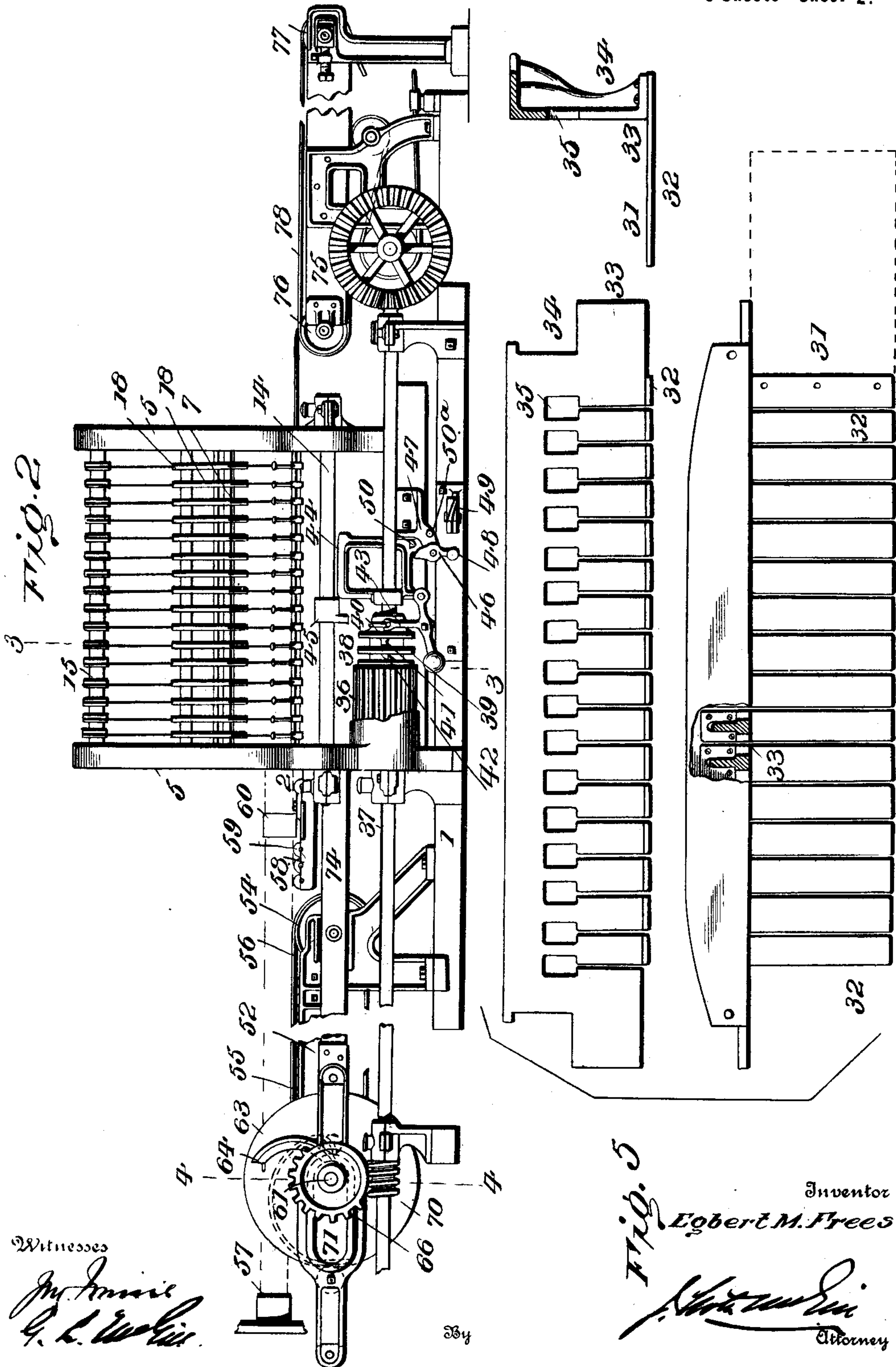
Patented June 4, 1901.

E. M. FREESE.  
BRICK AND TILE CUTTING MACHINE.

(Application filed Dec. 21, 1900.)

(No Model.)

6 Sheets—Sheet 2.



Witnesses

J. H. Freese  
G. L. Freese

Inventor

Egbert M. Freese

Attorney

No. 675,825.

Patented June 4, 1901.

E. M. FREESE.  
BRICK AND TILE CUTTING MACHINE.

(Application filed Dec. 21, 1900.)

(No Model.)

6 Sheets—Sheet 3.

Fig. 3.

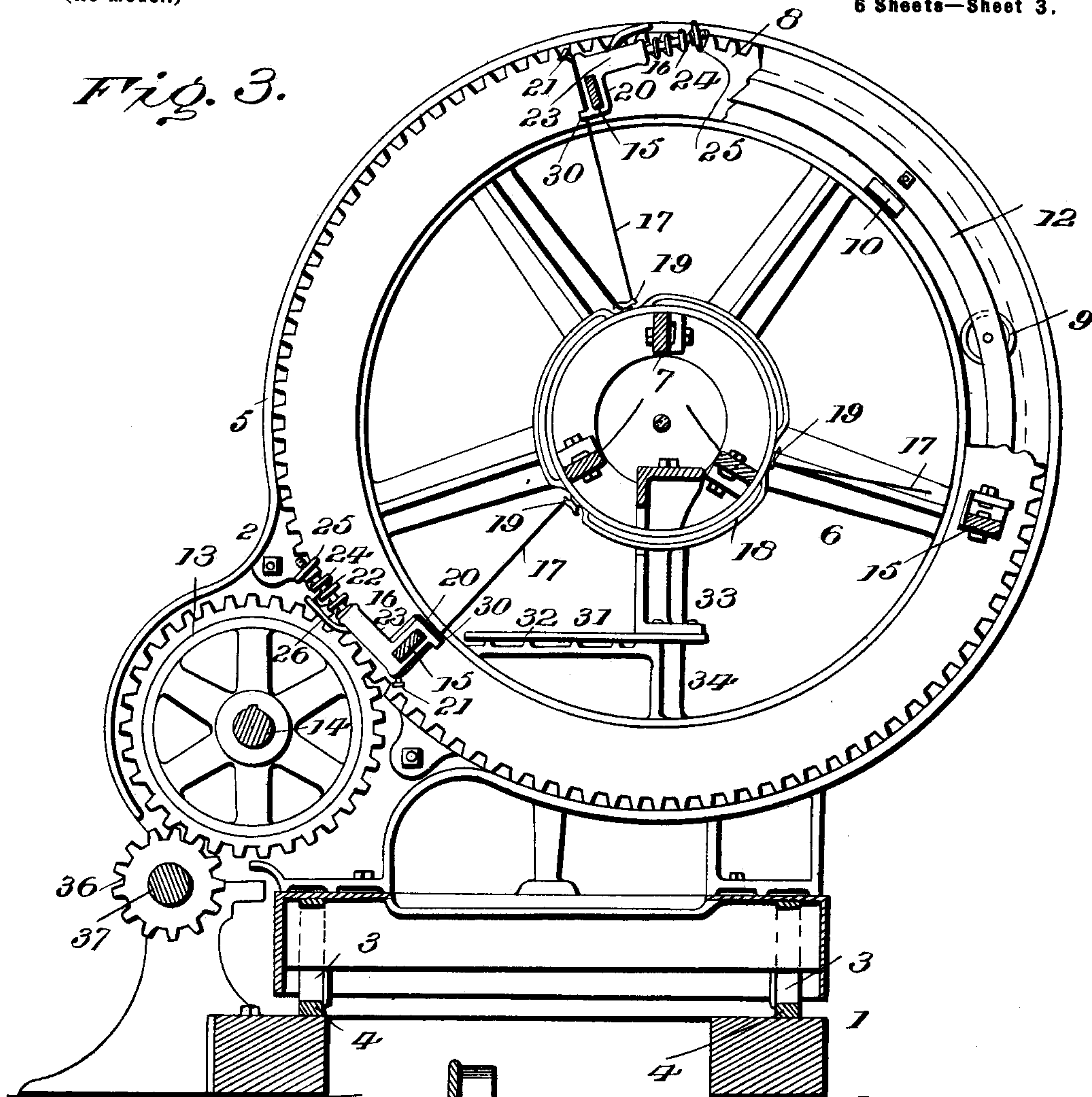
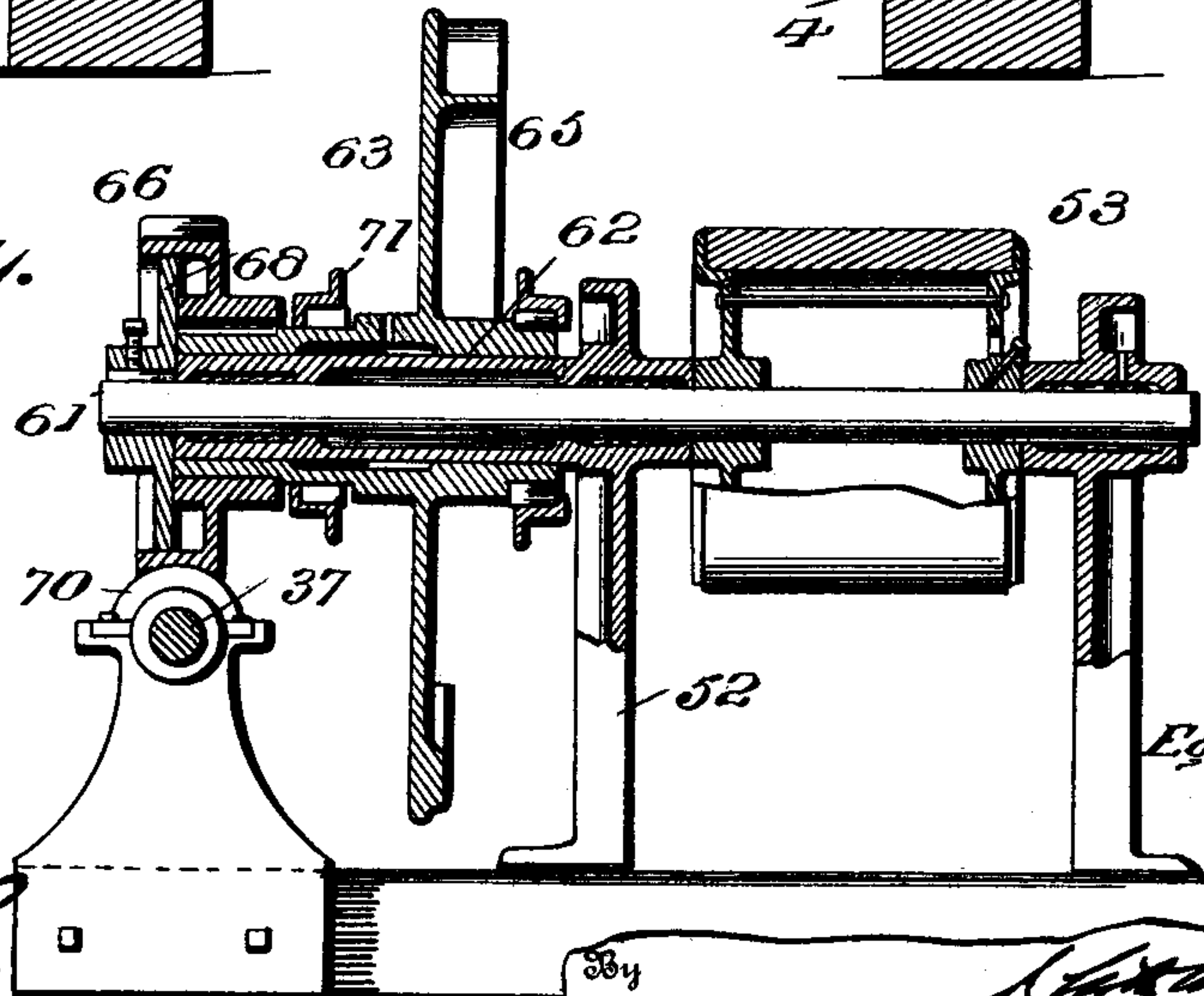


Fig. 4.



Witnesses  
*John J. Smith*  
*G. L. Smith*

Inventor  
*Robert M. Freese*

*Robert M. Freese* Attorney



No. 675,825.

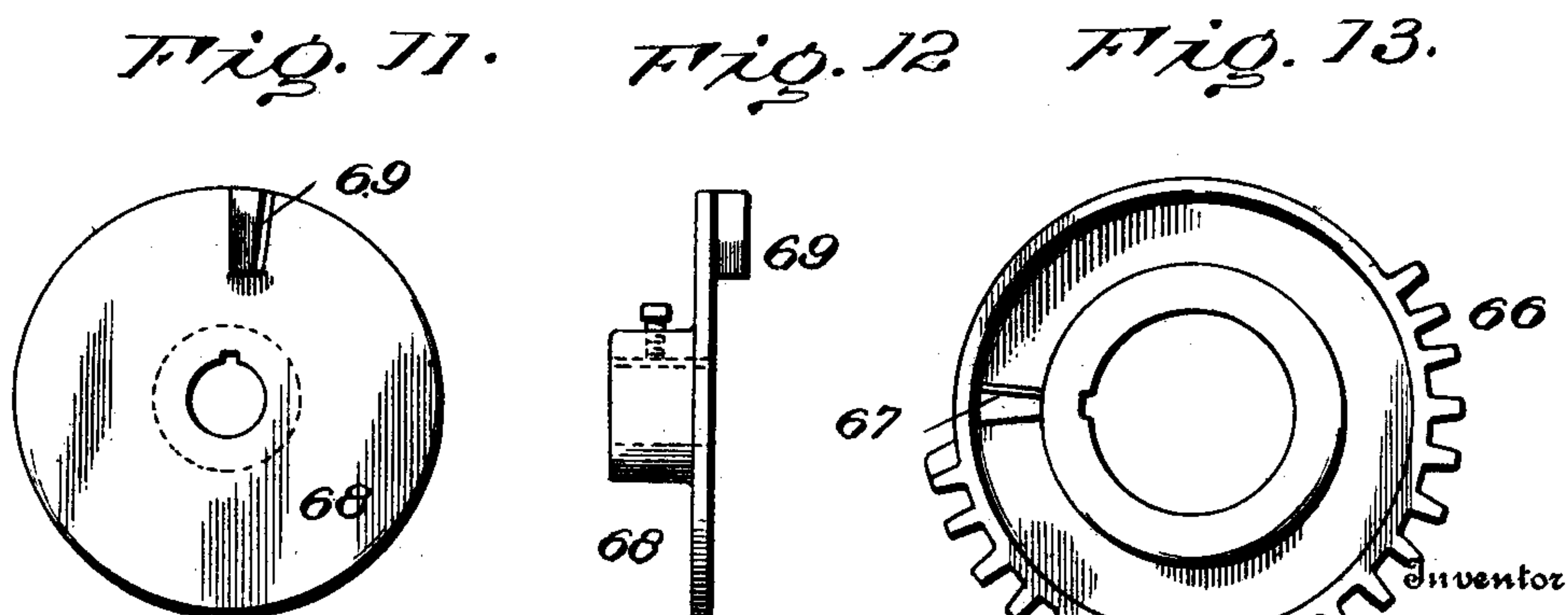
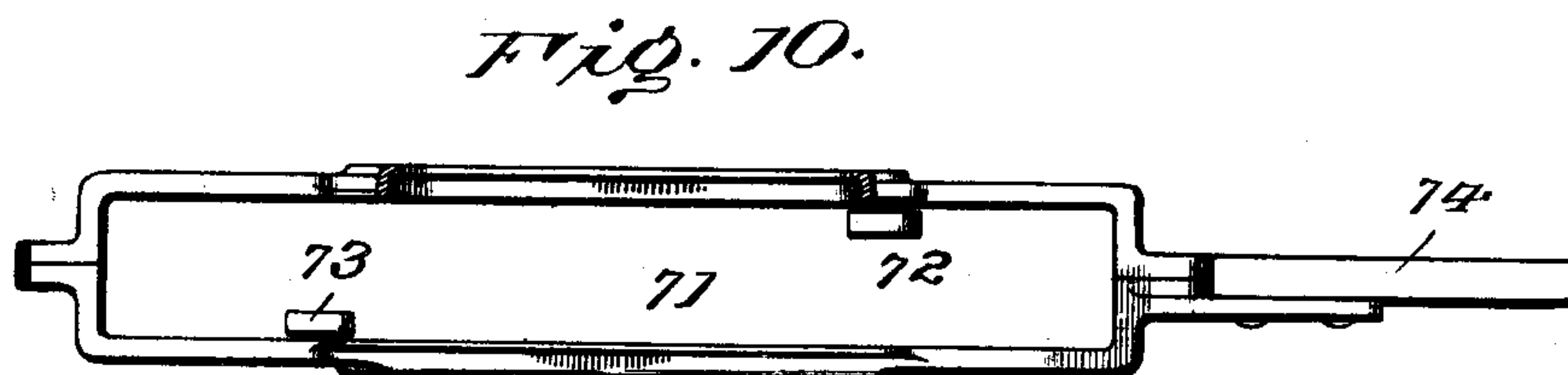
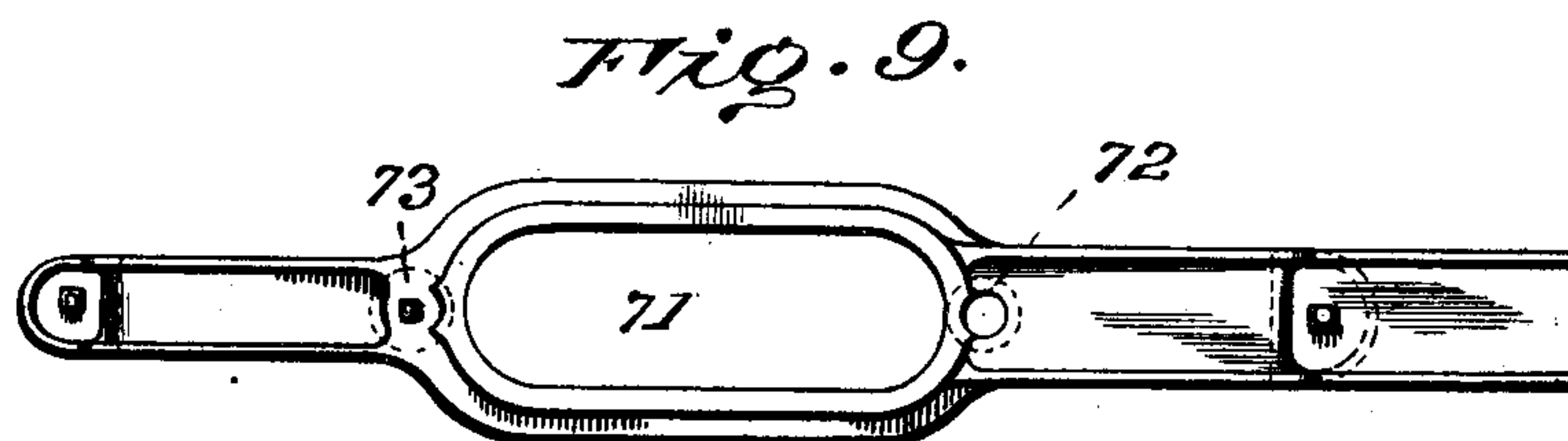
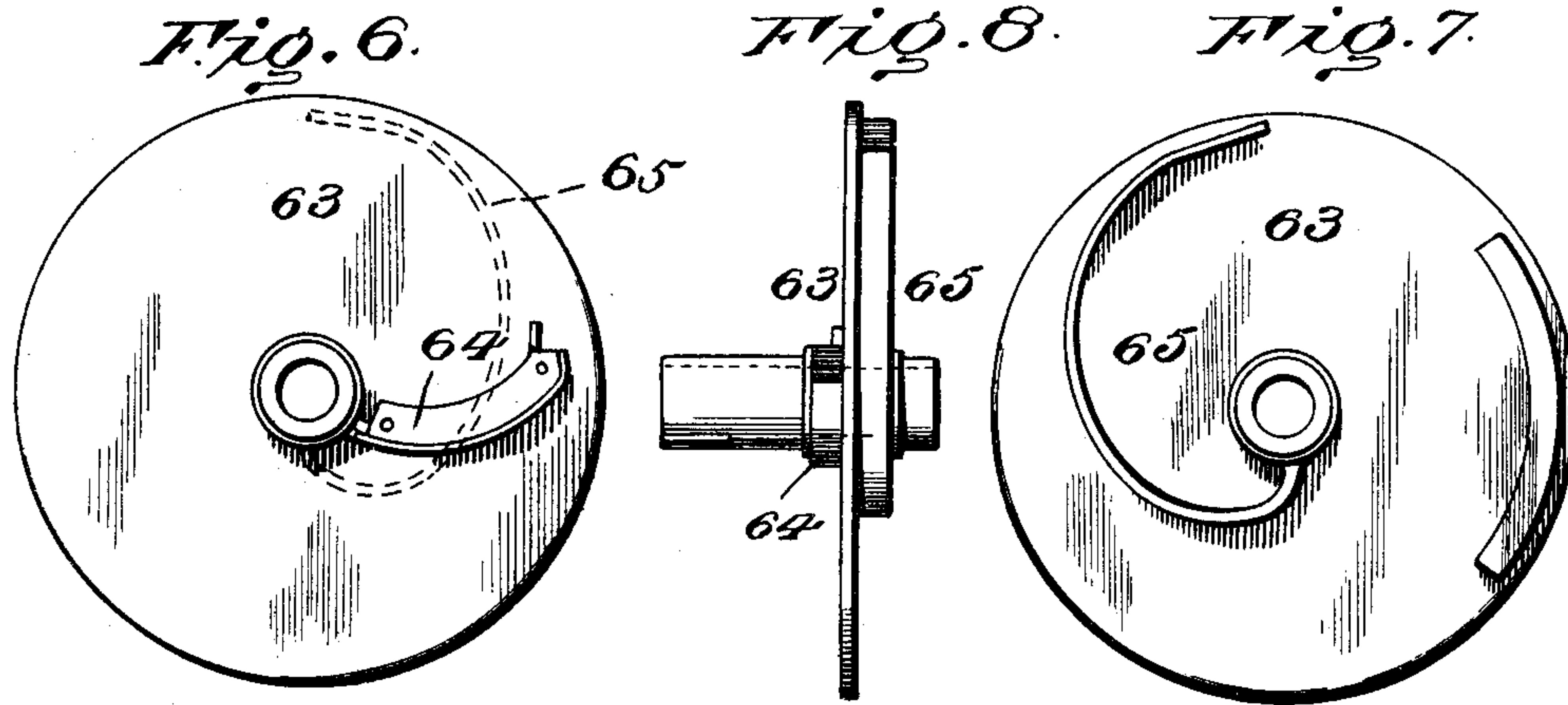
Patented June 4, 1901.

**E. M. FREESE.**  
**BRICK AND TILE CUTTING MACHINE.**

(Application filed Dec. 21, 1900.)

(No Model.)

6 Sheets—Sheet 4.



Witnesses  
*Johnnie*  
*Chapman & Co.*

384

Inventor  
*E. M. Freese*  
Attorney

No. 675,825.

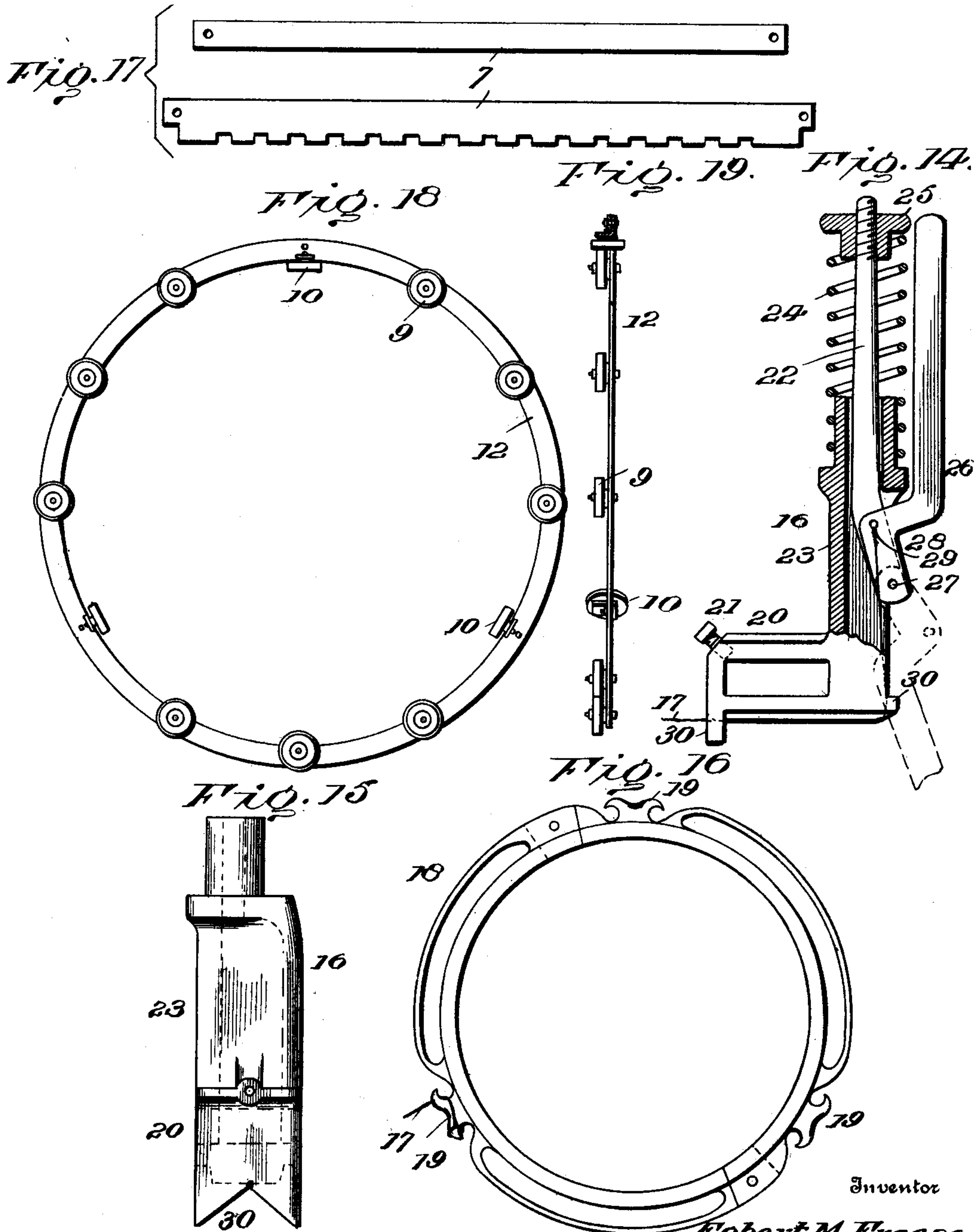
Patented June 4, 1901.

E. M. FREESE.  
BRICK AND TILE CUTTING MACHINE.

(Application filed Dec. 21, 1900.)

(No Model.)

6 Sheets—Sheet 5.



Witnesses

*per Maurice  
Haffner L. Eschler*

Inventor

*Egbert M. Freese*

Attorney

*[Signature]*

No. 675,825.

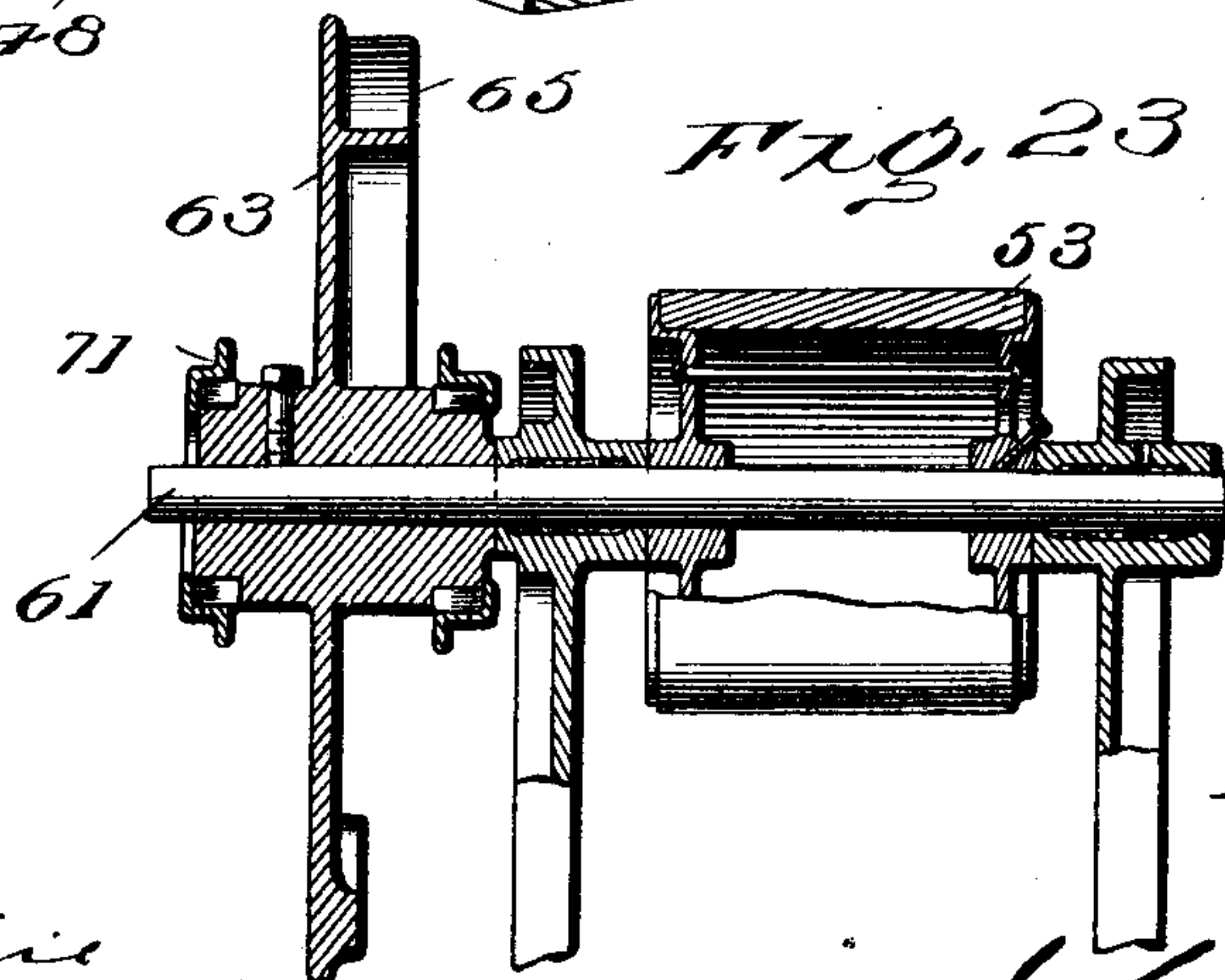
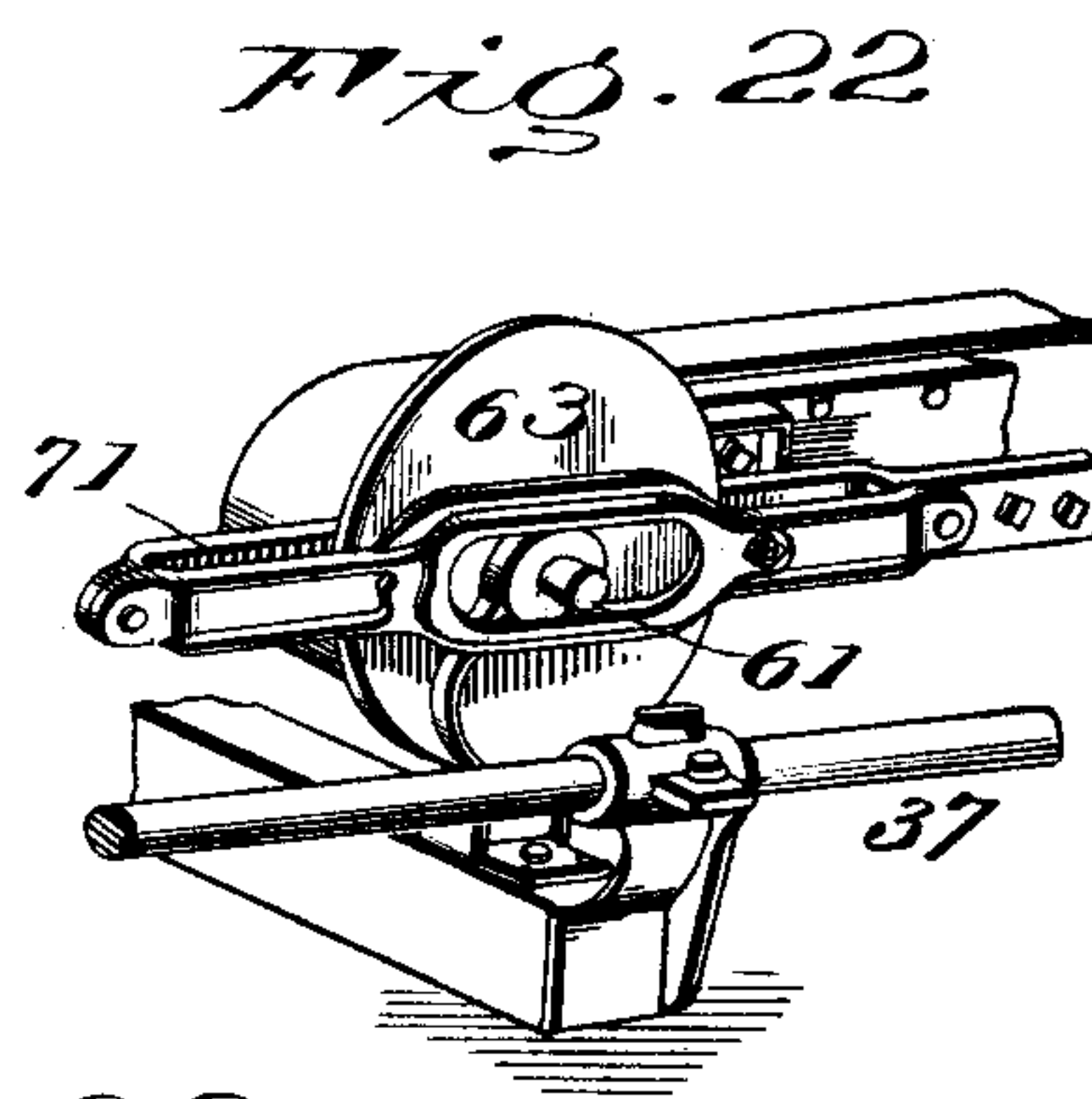
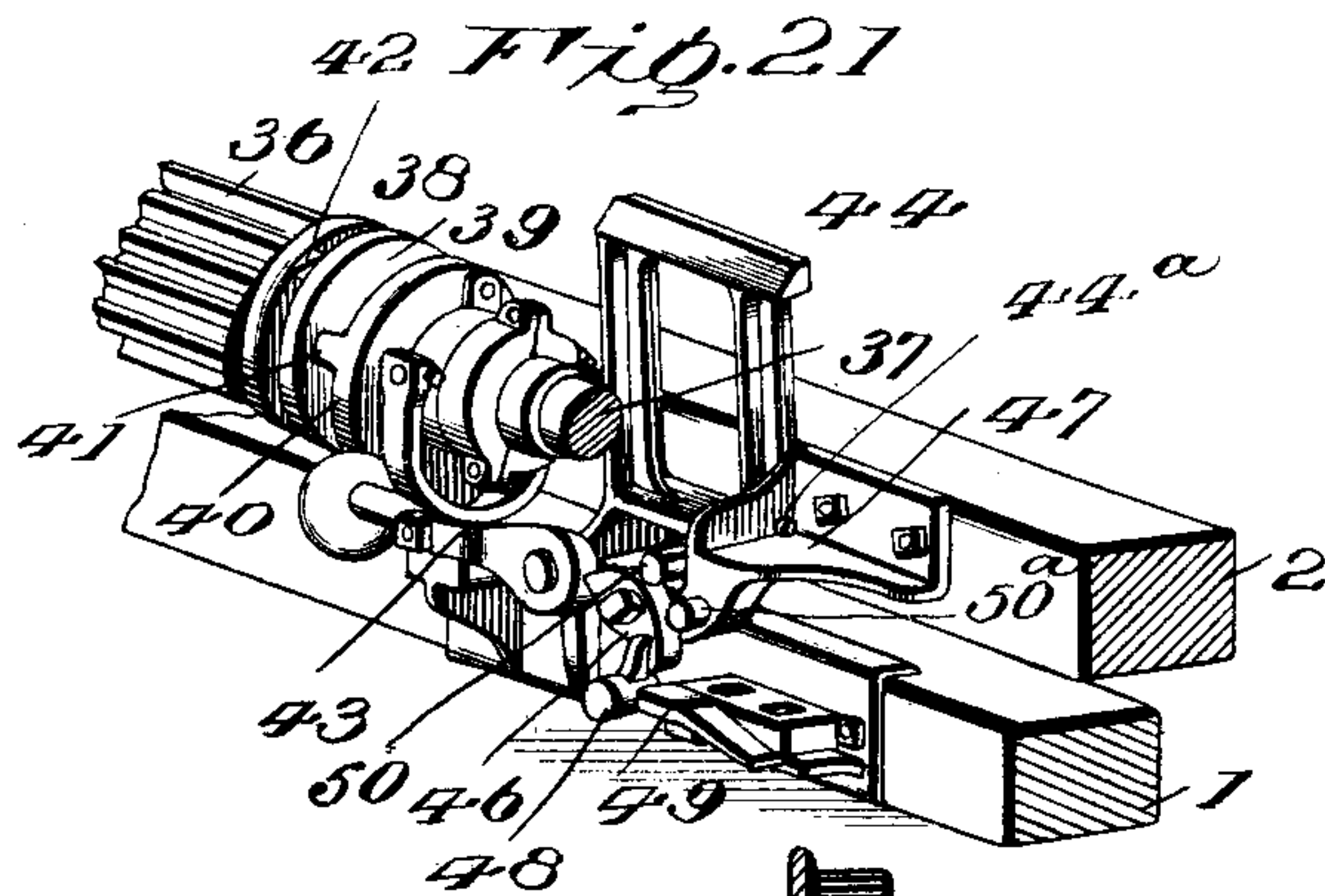
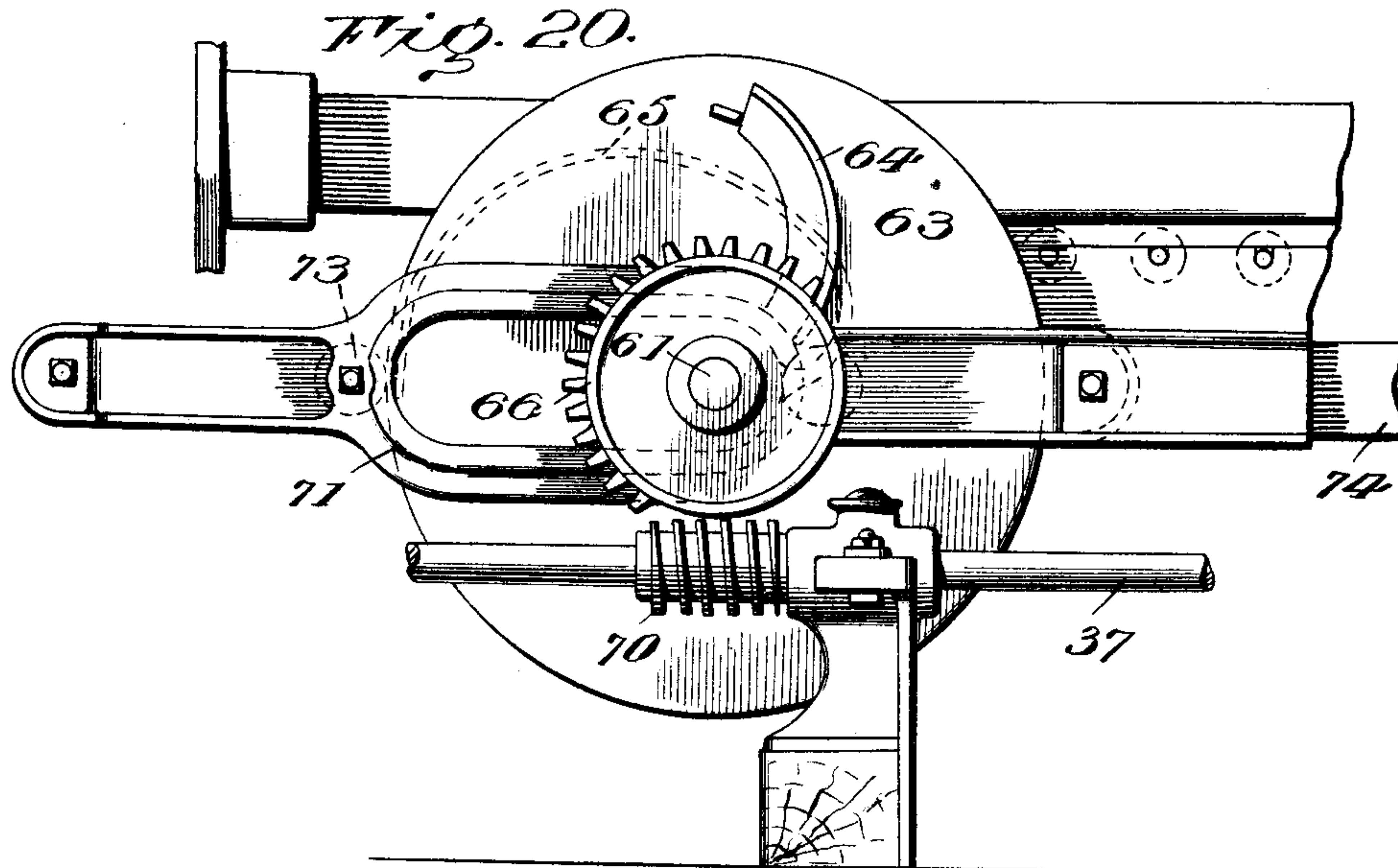
Patented June 4, 1901.

E. M. FREESE.  
BRICK AND TILE CUTTING MACHINE.

(Application filed Dec. 21, 1900.)

(No Model.)

6 Sheets—Sheet 6.



Witnesses  
J. M. Mice  
Chas. L. L. L.

Inventor  
E. M. Freese

By *[Signature]* Attorney



# UNITED STATES PATENT OFFICE.

EGBERT M. FREESE, OF GALION, OHIO.

## BRICK AND TILE CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 675,825, dated June 4, 1901.

Application filed December 21, 1900. Serial No. 40,664. (No model.)

*To all whom it may concern:*

Be it known that I, EGBERT M. FREESE, of Galion, in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Brick and Tile Cutting Machines; and I do hereby 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.

This invention contemplates certain new and useful improvements in brick and tile cutting machines, and has special reference to that class receiving the bar, slab, or column of clay as it issues from the die of a brick or tile machine and automatically cutting the same into sections of the proper proportions.

The primary object of the invention is to combine great simplicity and durability with completely automatic and positive operation, avoiding the serious objections which are found in reciprocating or vibrating cutters in which the wires operate horizontally or vertically and the objections to the continuously-operating reel-cutters.

A further object is to provide improved means for locking each cutting-wire to the reel and to provide the same with an independent tension and means for regulating the latter.

A further object is to avoid ragging or roughening the edges of the bricks or tiles in the cutting thereof.

A further object is to provide improved means for automatically cutting the clay into sections of the proper thickness at whatever rate of speed the same may pass from the brick or tile machine.

A further object is to provide improved means for operating the cutting-wheel while its support is moving in unison with the bar of clay, so that the bricks or tiles shall be cut off square and straight.

A further object is to provide a cutting-table of such construction that the bar of clay cannot become wedged thereon.

A further object is to provide improved means for effecting the cutting of the clay, whereby there can be no failure to complete the cut and in case of breakage of a wire

the same will not form an obstruction to the passage of the clay bar.

A further object is to enable broken wires to be replaced without interfering with the operation of the machine; and a further object is to simplify the construction of machines of this class and increase the efficiency of operation.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in perspective. Fig. 2 is a side elevation with portions broken away. Figs. 3 and 4 are transverse sectional views on lines 3 3 and 4 4, respectively, Fig. 2. Fig. 5 shows front and plan views of the clay-supporting table. Figs. 6 and 7 are opposite side views of the cam-disk by which the reel-supporting carriage is actuated. Fig. 8 is an edge view thereof. Figs. 9 and 10 are respectively side and bottom plan views of the yoke with which the cam-disk is designed to engage. Figs. 11, 12, and 13 are enlarged details of co-acting parts of the carriage-actuating mechanism. Fig. 14 is an enlarged vertical sectional view of one of the wire-holders, the lever being also shown in dotted lines. Fig. 15 is an end view of the casting of the holder. Fig. 16 is a side elevation of one of the wire-carrying rings. Fig. 17 is a view of one of the bars around which these rings revolve. Fig. 18 is a front elevation, and Fig. 19 an edge view, of one of the frictional roll-rings. Fig. 20 is an enlarged view of the carriage-actuating mechanism. Fig. 21 is an enlarged view of the clutch and its adjuncts. Fig. 22 is a perspective view of a modified arrangement of the carriage-actuating mechanism. Fig. 23 is a cross-sectional view thereof.

Referring to the drawings, 1 designates a stationary frame, 2 a carriage movable longitudinally on said frame, resting on wheels 3, which travel on rails 4, secured to frame 1. Fixedly mounted on this carriage are two gear-cases 5 open on their inner opposite sides and formed each with a spider 6, the two spiders being connected together by a series of cross-bars 7, arranged equal distances from the centers of the gear-cases. Within these latter are gear-rings 8 of a cut-



ting-reel, each ring being toothed on its periphery and formed with right-angular portions (in cross-section) which contact with frictional rolls 9 and 10, supported by rings 12, located within the gear-cases, the rolls 9 being vertically disposed and the rolls 10 horizontally. The two toothed gear-rings 8 mesh with and are rotated by two gear-wheels 13, fast on a shaft 14, journaled in the gear-cases. These rings 8 are connected by three cross-bars 15, upon each of which is mounted means for holding and regulating the tension of each of the cutting-wires, such means consisting, preferably, of a holder 16, to which is connected the outer end of one of the cutting-wires 17. Preferably there are three sets of cutting-wires, each set being spaced equal distances apart, and the spaces between the wires of each set represent the thickness of a brick or tile. Each wire at its inner end is secured to one of a series of rings 18, fitting in grooves of and revoluble on the cross-bars 7, which latter act as guides for said rings. Each ring is formed, preferably, in two sections, with their ends united, and is provided with three sets of double prongs 19. With one prong of each set the looped end of a cutting-wire is placed in engagement, and the wire is then drawn beneath the other prong and then carried radially toward the periphery of the reel and attached to its respective holder 16. Each of these holders embodies a casting 20, held by a screw 21 to its respective cross-bar 15, a rod 22, passed through a tubular portion 23 of the casting, a coil-spring 24, the tension of which is regulated by a nut 25 on said rod, and a lever 26, pivoted at 27 to the lower end of rod 22. This lever is formed with an angular portion 28, the inner end of which corresponds to a slight angularity in the lower end of rod 22. From one side of lever 26 projects a lug 29, on which the outer looped end of the wire is designed to be placed when the lever is thrown outward out of parallelism with the rod 22, the tension of the spring being then released. When the wire is thus attached to the lever, the latter is turned on its pivot and draws the rod 22 against the tension of its spring, which latter holds the lever locked in position in parallelism with said rod, the pull exerted by the cutting-wire being to one side of the pivot of the lever. The adjustment of the nut enables different tensions to be placed upon each wire, and this tension is such that it prevents any undue strain on or breakage of the wires when passing through the clay and in addition serves to keep the several wires tightly stretched, even though their lengths be somewhat increased while in use by the stretching or loosening of the loops in the ends. Should any wire be broken while the machine is in operation, the lever of its respective holder can be thrown over to the limit of its movement, so as to place its lug 29 nearer to the point at which the other end of the wire is secured, whereupon a new wire

can be easily put in place. Such wire, being first secured to its carrying-ring 18 at the axis of the reel, is carried between the bearing-prongs 30 of the casting 20 and then bent at right angles to its radiation, and after its end is attached to the lug 29 the lever is returned to its normal position, compressing the spring to the necessary extent, regulated by the length of the wire, measuring from the loops at the extremities.

There being three sets of cutting-wires on the reel and the latter being only intermittently rotated one-third of a complete revolution at each operation, it is obvious from the described construction of the wire-holders that new wires may be substituted for broken ones without interrupting the operation of the machine, a new wire being attached while the gear-rings of the reel are at rest after one of the series of wires has performed its work.

31 designates the cutting-table upon which the bar of clay is supported while being cut into sections by the wires of the cutting-reel. This table embodies a series of spaced-apart plates 32, secured at one side to the lower flanged ends of spaced-apart depending portions 33 of a side bar 34, secured at its ends to the spiders of the gear-cases. Between the several portions 33 are slots similar to and in exact line with those between the plates 32, said slots in the side bar terminating in enlarged openings 35, wherein and through which the wire-carrying rings 18 are designed to work. It will be noted that the cutting-table has but one side bar, and hence no matter how expanded or swollen the bar of clay may be there is no danger of clogging. Furthermore, by employing the series of wire-carrying rings 18 the securing-point of the inner end of each wire is as near to the securing-point of the outer end thereof as the thickness of the clay bar will permit. By thus shortening the length of the wire the liability of lateral displacement or undue strain is reduced to a minimum. Then, too, by securing the wires to these rings and passing the latter through the openings 35 the spaced-apart portions of the side thrust-bar may be made integral parts of the latter.

One of the gear-wheels 13 meshes with and intermittently receives motion from a driving-pinion 36, loose on a constantly-operated shaft 37, with which it may be made to revolve by a clutch 38. This clutch is shown as comprising a collar 39, fast on said shaft, a sliding sleeve 40, capable of being longitudinally reciprocated and having dogs 41 projecting through openings in collar 39 and designed to be moved into engagement with lugs 42 on the end of pinion 36. The longitudinal movement of the clutch is effected by a lever 43, actuated by a rocker-arm 44, pivotally mounted on the frame 1 at 44<sup>a</sup>, which is thrown outward to disengage the clutch from the pinion by a finger 45 on shaft 14, while its reverse movement to throw in the



clutch is accomplished by a weighted tappet 46, hung on an arm 47, secured to carriage 2. As the latter starts to move in the direction of travel of and with the bar of clay the lower weighted end 48 of the tappet upon striking a trip in the form of a stationary abutment 49 of frame 1 the upper end of the tappet engages a lug 50 of rocker-arm 44, throwing the latter inward at its top and forcing the sliding sleeve 40 into engagement with pinion 36, which will thereupon be caused to rotate with the operating-shaft 37. As the lower end of the tappet rides over trip 49 (at which time its normally upper end is in engagement with a stop 50<sup>a</sup>) and frees itself of engagement with lug 50 it will upon the return movement of the clutch ride over the trip in an approximately horizontal position, forming no obstruction to the forward throw of the rocker-arm upon engagement therewith of finger 45.

Between carriage 2 and the brick-machine (a portion only of which latter is shown at 51) is located a frame 52, which supports at its ends drums 53 and 54 and between said drums idler-rolls 55. The drums carry an endless belt 56, which travels in line with the bottom of die 57, so as to receive the bar of clay issuing from the latter. Between the drum 54 and the reel-carriage is a roll-trough 58, mounted on the adjacent gear-case and equipped with lubricating-rolls 59 and 60, which are designed to lubricate the bottom and one side of the bar of clay to avoid liability of its adhering to the plate and side bar of the cutting-table. The drum 53 must be of circumference corresponding to the length of the bar to be positioned on the cutting-table at the time of each operation of the reel. This drum 53 is fixed on a shaft 61, which revolves in a fixed sleeve 62, projecting laterally from one side of frame 52. Upon this sleeve is loosely mounted a cam-disk 63, on one side of which is a cam 64 and on the other side a cam 65. Fast on the elongated hub of disk 63 is a segmentally-toothed worm-wheel 66, in the channeled or open side of which is a lug 67. Fast on the projecting end of shaft 61 is a disk 68, which fits in the channeled side of wheel 66 and is formed with a lug 69, designed to engage the lug 67 and effect the rotation of wheel 66 at the rate of speed at which drum 53 is rotating. On the operating-shaft 37, immediately below the shaft 61, is a worm 70, with which the worm-teeth of wheel 66 are designed to mesh. When this occurs, said wheel is caused to rotate at a speed greater than that of shaft 61; but when the engagement ceases wheel 66 will remain idle until its lug 69 is overtaken by lug 67, whereupon said wheel will again rotate in unison with shaft 61.

71 is a yoke straddling the hub of disk 63 on the sides thereof and provided with rollers 72 and 73, designed to be engaged, respectively, by the cams 64 and 65. This yoke is connected to the nearer of the two gear-cases of reel-carriage 2 by a bar 74.

75 is a frame beyond the outer end of frame 1 in line with the discharge from the cutting-table. It is provided with drums 76 and 77 and an endless belt 78, to which motion is communicated from shaft 37 by suitable gearing. The speed of travel of belt 78 being faster than the travel of the bar of clay, the bricks are separated as they are received by this belt, so that they may be conveniently removed and may also be carried away the desired distance, according to the length of the belt.

In practice the reel-carriage 2 when at rest is at that end of its longitudinal movement toward the brick-machine, and the shaft 37 is constantly operated by any suitable means, preferably the mechanism by which the brick-machine is operated, and the pinion 36 is idle on said shaft while the clutch members are rotating with the latter. The bar of clay fed onto the belt 56 from the die of the brick-machine causes said belt to travel with it, which motion is communicated by drum 53 to disk 68, and upon the lug 69 of the latter engaging the lug 67 of worm-wheel 66 the cam-disk 63 will also revolve at the same speed as the bar of clay and belt 56. Upon the cam 64 acting on roller 72 the yoke is moved longitudinally, causing carriage 2 to move with it at the speed of travel of the bar of clay. Upon the pallet 46 engaging trip 49 the rocker-arm will be thrown inward to actuate the clutch and place it in engagement with pinion 36, communicating motion through gear-wheels 13 to the gear-rings 8 of the cutting-reel. The latter is thus caused to revolve while the carriage is being moved longitudinally with the bar of clay. The action of the reel is to carry one set of cutting-wires through the clay and sever the same into bricks or tiles of the required thickness, the reel being rotated one-third of a complete revolution while the gear-wheels 13 have made a complete revolution. As the shaft 14, carrying these gear-wheels, is completing its revolution the finger 45 thereon engages the rocker-arm and throws it outwardly to disengage the clutch members from pinion 36. By the time cam 64 completes its contact with roller 72 the reel-carriage has reached the limit of its outer longitudinal movement away from the brick-machine and the cutting operation has been completed. As this occurs the worm-teeth of wheel 66 engage positively with worm 70, the speed of which moves the cam-carrying disk 63 faster than or equally as fast as the movement imparted thereto by the bar of clay. As wheel 66 is engaged by worm 70 the cam 65 acts on roller 73 of the yoke and through the connection of the yoke to the reel-carriage returns the latter to its starting-point. As the movement of the cam-disk ceases when the teeth of wheel 66 are freed from engagement with the worm, as shown in Fig. 2, cam 65 remains in contact with roller 73, so as to hold the carriage securely in position until the cam-disk is again set in motion by lug 69 of disk 68 over-



taking the lug 67 of wheel 66, at which time the cam-disk will again be actuated by the travel of the bar of clay, disengaging roller 73 and cam 65 and bring cam 64 again into  
 5 action against roller 72, whereupon the reel-carriage will be again moved longitudinally and the next of the series of cutting-wires will perform its work of severing the clay. It is evident that the circumference of drum  
 10 53 must be such that the lugs 67 and 69 will be brought into engagement and the carriage be released when the end of the uncut portion of the bar of clay has reached the slot in the cutting-table farthest from the brick-machine, and as cam 64 is of the proper form to  
 15 move the carriage in unison with the movement of the clay the action of the cutting-wires on the latter will be exactly the same as if both the carriage and bar of clay were  
 20 at rest.

The action of the cutting-wires being diagonally downward and backward in passing through the clay, the edges of the latter are left smooth and free of roughness, results not obtainable if the movements of the wires were  
 25 horizontal and the wires themselves vertical. Since the length of wire in the clay at any time is comparatively short, strain thereon is reduced and the wire is less liable to deflection than in cutters using horizontal wires acting  
 30 upon the entire width of the clay bar at one time or as is the case with wires extending from the exact center of a reel to the periphery thereof. It will also be noted that I use but  
 35 one side bar on the cutting-table, thus avoiding the objections arising where two side bars are required, as where the cutting-wires act alternately from one side to the other. The use of two side bars is objectionable, because the bar of clay is not always of uniform width, since when it is softer at one  
 40 time than another it has the tendency to swell or enlarge, causing it to become wedged between the two side bars. It will also be noted that in my present machine there is an absence of small or complicated parts or any likely to require readjustment to suit varying conditions of the clay. It is obvious that the  
 45 proportions of the parts may be made so as to cut the clay into pieces of such size as may be desired and as rapidly as discharged by the brick-machine, since the operation of the carriage and reel is controlled by the speed at which the bar of clay travels from such  
 50 machine.

Although the machine as shown and described is an embodiment of the form I have found to be most desirable and productive of the best results, yet within the scope of my  
 60 invention changes may be made in the construction and arrangement of various parts, the invention not being restricted to those shown and described. For instance, the gear-rings of the reel may be supported in any suitable manner, that shown being especially designed to avoid wear consequent upon friction. Again, the sets of cutting-wires and the

supporting-bars 15 may be increased or lessened, if desired, and the wire-carrying rings 18 instead of rotating around stationary guide-  
 70 bars may engage a suitable roller-support, and the cutting-wires may be attached at their ends by means other than that shown. Then again, the actuating cam-disk 63, by which the carriage is moved longitudinally,  
 75 may be secured directly to the belt-drum shaft, to the end that it will be continuously revolved by said drum for actuating the yoke in both directions, thus dispensing with worm-wheel 66, worm 70, and starting-disk 68.  
 80 This modified arrangement is shown in Figs. 22 and 23, wherein the sleeve 62 is dispensed with. The yoke and its rollers and the cams on the disk are the same as before described. In one revolution of the drum 53 and cam-disk  
 85 63 the carriage is moved forward while the reel-wires are passing through the clay and is then returned to its starting-point.

I claim as my invention—

1. In a brick-cutting machine, the combination of the following instrumentalities: a  
 90 carriage having longitudinal movements, a cutting-table and a cutting-reel, both supported by said carriage, means actuated by the bar of clay for moving the carriage comprising a drum, an actuating member operated by said drum, means secured to the carriage designed to be engaged by said member,  
 95 a constantly-operated shaft, and means actuated by said shaft for rotating said reel, as set forth.

2. In a brick-cutting machine, the combination of the following instrumentalities: a carriage having longitudinal movements, a cutting-table and a cutting-reel, both supported by said carriage, means actuated by  
 105 the bar of clay for moving the carriage, comprising a drum, an actuating cam member operated by said drum, a bar connected to the carriage and engaged by said cam member for moving the carriage in opposite directions,  
 110 a constantly-operated shaft and means actuated by said shaft for rotating said reel, as set forth.

3. In a brick-cutting machine, the combination of the following instrumentalities: a carriage having longitudinal movements, a cutting-table and a cutting-reel, both supported by said carriage, means actuated by  
 115 the bar of clay for moving the carriage in unison therewith, means for automatically actuating said cutting-reel during such movement and independently-operated means for effecting the return of said carriage after the reel has completed its partial rotation, as set  
 120 forth.

4. In a brick-cutting machine, the combination of the following instrumentalities: a carriage having longitudinal movements, a cutting-table and a cutting-reel, both supported by said carriage, means actuated by  
 130 the bar of clay for moving the carriage in unison therewith, comprising a drum, an actuating member, operated thereby in moving



the carriage in one direction, a constantly-operated shaft, means actuated by said shaft for partially rotating said reel, and means also actuated by said shaft for operating said  
5 actuating member independently of the drum to return the carriage after the reel has been rotated, as set forth.

5. In a brick-cutting machine, the combination of the following instrumentalities: a  
10 carriage having longitudinal movements, a cutting-table and a cutting-reel, both supported by said carriage, means actuated by the bar of clay for moving the carriage in unison therewith comprising a drum, an actuating member, operated by said drum in  
15 moving the carriage in one direction, means for effecting the partial rotation of the reel during such movement, and means for actuating said member, independently of said  
20 drum, for returning the carriage after the reel has been partially rotated, substantially as set forth.

6. In a brick-cutting machine, the combination of the following instrumentalities: a  
25 carriage having longitudinal movements, a cutting-table and a cutting-reel, both supported by said carriage, means actuated by the bar of clay for moving the carriage in unison therewith comprising a drum, an actuating-wheel, operated by said drum in moving the carriage in one direction, said wheel  
30 having two cams, a yoke, a connection between the latter and the carriage, said yoke being moved in opposite directions by said  
35 cams, means for effecting the partial rotation of the reel during the forward movement of the carriage, and means for actuating said cam-wheel independently of said drum for effecting the return of the carriage, as set  
40 forth.

7. In a brick-cutting machine, the combination of the following instrumentalities: a carriage having longitudinal movements, a cutting-table and a cutting-reel, both supported by said carriage, means actuated by the bar of clay for moving the carriage in unison therewith comprising a drum, an actuating-wheel, operated by said drum in moving the carriage in one direction, having two  
45 cams, a yoke, a connection between the latter and the carriage, said yoke being moved in opposite directions by said cams, a constantly-operated shaft, means actuated by said shaft for partially rotating said reel, and  
50 means also actuated by said shaft for operating said cam-wheel independently of the drum to return the carriage after the reel has been rotated, substantially as set forth.

8. In a brick-cutting machine, the combination of the following instrumentalities; a  
60 carriage having longitudinal movements, a cutting-table and a cutting-reel, both supported by said carriage, a shaft, a drum thereon operated by the bar of clay, a disk fast on said shaft, a loose wheel actuated in part by said disk, a cam-wheel carrying said loose  
65 wheel, a yoke connected to said carriage and

actuated by said cam-wheel, a constantly-operated shaft, means actuated by the latter for partially rotating said reel, and means on said  
70 shaft for operating said loose wheel and cam-wheel independently of the drum-shaft, substantially as set forth.

9. The combination with the carriage, of a shaft operated by the bar of clay, an actuating member operated by said shaft embracing two cams for moving said carriage forward in unison with the movement of the bar of clay, and upon the completion of such movement returning said carriage to its normal position, cutting mechanism, and means for automatically actuating the same during said forward movement of the carriage, as set forth.

10. The combination with the carriage, of the feed-belt, a drum actuated thereby, and  
85 an actuating member operated by said drum embracing two cams for moving said carriage forward in unison with the movement of the bar of clay, and upon the completion of such movement returning said carriage to its normal position, cutting mechanism, and means for automatically actuating the same during said forward movement of the carriage, as set forth.

11. The combination with the carriage, the yoke, and the bar connecting the latter to the carriage, of a shaft operated by the bar of clay, two cams for moving said yoke in opposite directions, said shaft effecting one of said movements through one cam, and independently-operated means for effecting the other of said movements through the other cam at the termination of the first movement.

12. The combination with the carriage, the yoke, and the bar connecting the latter to the carriage, of a shaft operated by the bar of clay, a loosely-mounted wheel having two cams for moving said yoke in opposite directions, means whereby said wheel will be operated by said shaft, and means for operating  
110 said wheel independently of said shaft and in advance thereof, said wheel remaining at rest until again actuated by said shaft.

13. The combination with the carriage, and the cutting-table, of two cases mounted on  
115 the carriage, two opposed reel-rings mounted in said cases, bars connecting said reel-rings, central bars connecting said cases, cutting-wires secured to said ring-bars, holders for said wires revolubly mounted on said case-bars, and means for rotating said reel-rings.

14. The combination with the carriage, and the cutting-table, of two cases on the carriage, two opposed reel-rings mounted in said cases, bars connecting said rings, central bars  
125 connecting said cases, wire-holding rings rotatable on said case-bars, wires secured to said holding-rings, means for yieldingly securing the outer ends of the wires to said ring-bars, and means for engaging said reel-rings for rotating the reel, substantially as set forth.

15. The combination with the carriage, and the cutting-table, of two cases mounted on



the carriage, rings in said cases having frictional rolls, reel-rings also in said cases engaging said rolls, bars connecting said reel-rings, central bars connecting said cases, 5 wire-holders revoluble on said central bars, wires secured thereto, and means for securing the outer ends of said wires to said ring-bars, substantially as set forth.

16. The combination with the carriage and 10 the reel having radially-extended cutting-wires, of the cutting-table having spaced-apart depending portions forming a side thrust-bar and a horizontal portion consisting of spaced-apart plates secured at one end 15 to the lower ends of said depending portions, as set forth.

17. The combination with the carriage, of the casings mounted thereon having a series of stationary connecting-bars all of which are 20 equidistant from the centers of said casings, the reel, circular wire-holders revoluble around said connecting-bars, radially-extended cutting-wires, and the cutting-table having a side thrust-bar formed with slots 25 and openings to permit, respectively, of the passage of the wires and the circular holders, as set forth.

18. The combination with the carriage, and the reel having central revoluble circular 30 wire-holders and radially-extended cutting-wires, of the cutting-table having a side thrust-bar formed with a series of closely-arranged depending portions permanently united at their tops and formed with intervening slots and openings, and horizontally- 35 disposed spaced-apart plates secured to the lower ends of said depending portions, substantially as set forth.

19. The combination with the carriage, of 40 the cutting-table fixedly mounted thereon having a side thrust-bar formed with openings, passages for the wires being provided in the table and thrust-bar, the reel having two end rings, holders revoluble around the 45 axis of the reel and extended through the openings in the side thrust-bar, cutting-wires secured at their inner ends to said holders, and means for securing the outer ends of said wires to said connecting-bars, substan- 50 tially as set forth.

20. The combination with the carriage, of the cutting-table fixedly mounted thereon having horizontal and vertical slots and openings in which said vertical slots terminate, a 55 reel comprising end rings, bars connecting said end rings, central stationary bars, rings revoluble on the latter extended through said openings in the cutting-table, and cutting-wires secured to said ring-bars and said rev- 60 oluble rings, substantially as set forth.

21. The combination with the carriage, and the cutting-table, of the reel having gear-rings and radially-arranged cutting-wires, connections between said gear-rings, a shaft, 65 gear-wheels thereon meshing with said gear-rings, and means for operating said gear-wheels, substantially as set forth.

22. The combination with the carriage, and the cutting-table, of the reel having gear-rings and radially-arranged cutting-wires, 70 connections between said gear-rings, a shaft, gear-wheels thereon meshing with said gear-rings, a constantly-operated shaft, a pinion loose thereon in mesh with one of said gear-wheels, and means for periodically locking 75 said pinion to said shaft, substantially as set forth.

23. The combination with the carriage and the cutting-table, of the reel having gear-rings and radially-arranged cutting-wires, 80 connections between said gear-rings, a shaft, gear-wheels thereon meshing with said gear-rings, a constantly-operated shaft, a pinion loose thereon in mesh with one of said gear-wheels, a clutch for locking said pinion to 85 said shaft, and means for operating said clutch, as set forth.

24. The combination with the carriage, and the cutting-table, of the cutting-reel, a constantly-operated shaft, and gearing interme- 90 diate said shaft and the reel for effecting the rotating of the latter, comprising a member loose on said shaft, a clutch for locking said member to the shaft, a rocker-arm, a lever for operating said clutch engaged by said 95 rocker-arm, and means for alternately operating the latter as the carriage is moved in opposite directions, substantially as set forth.

25. The combination with the carriage, and the cutting-table, of the cutting-reel, a constantly-operated shaft, and gearing interme- 100 diate said shaft and the reel for effecting the rotation of the latter, comprising a member loose on said shaft, a clutch for locking said member to the shaft, a rocker-arm, a lever 105 for operating said clutch engaged by said rocker-arm, a tappet, carried by the carriage for moving said rocker-arm in one direction, a trip for said tappet, and a rotary device for actuating said rocker-arm in the reverse di- 110 rection, substantially as set forth.

26. The combination with the carriage, and the cutting-table, of the cutting-reel, a constantly-operated shaft, and gearing interme- 115 diate the shaft and the reel for effecting the rotation of the latter, comprising a member loose on said shaft, a clutch, a rocker-arm for actuating said clutch, a tappet carried by the carriage, a trip for said tappet, and a fin- 120 ger rotated by said gearing, said tappet and finger being designed to operate said rocker-arm in opposite directions, substantially as set forth.

27. The combination with the reel having a series of cross-bars at or near its periphery, 125 and wire-holders at or near its axial center, of the outer wire-holders mounted on said cross-bars having tension-controlled means, and members movable independently of said means for throwing on and off the tension of 130 the several last-mentioned wire-holders, and cutting-wires radiating from said central wire-holders and engaging said tension-controlled means, as set forth.



28. The combination with the reel having a series of cross-bars at or near its periphery, and the casing upon which the reel is revoluble also having a series of cross-bars which latter are all equidistant from the axial center of the reel, of the cutting-wires extending radially from said cross-bars of the casing, wire-holders revoluble around said latter cross-bars, wire-holders mounted on said cross-bars of the reel having tension-controlled means and independently-movable members for throwing on and off the tension of the several wire-holders, substantially as set forth.

29. The combination with the reel having a series of cross-bars at or near its periphery, and the casing upon which the reel is revoluble also having a series of cross-bars which latter are all equidistant from the axial center of the reel, of the cutting-wires extending radially from said cross-bars of the casing, wire-holders revoluble around said latter cross-bars, having each a series of lugs, each of said cutting-wires having looped ends, wire-holders mounted on said cross-bars of the reel having each an independently-movable member provided with a lug for engagement therewith of the outer looped end of its respective cutting-wire, and tension-controlled means forming part of each holder, and to which one of the independently-movable members is secured, as set forth.

30. The combination with the reel having cross-bars at its periphery, and the radially-extended cutting-wires, of wire-holding means mounted on said cross-bars for exerting a pull on the wires, comprising independently-movable pivoted members to which the wires are secured, and springs acting on but supported independently of such members, as set forth.

31. The combination with the reel having cross-bars at its periphery, and the radially-extended cutting-wires, of wire-holding means mounted on said cross-bars for exerting a pull on the wires, comprising a rod spring-actuated in the direction of its length, and a lever pivoted at one end to one end of such rod and to which lever one of the cutting-wires is attached at a point near its pivot-bearing, as set forth.

32. The combination with the reel having cross-bars at its periphery, and the radially-extended cutting-wires, of wire-holding means mounted on said cross-bars for exerting a pull on the wires, comprising castings mounted on said cross-bars having tubular portions, longitudinally-movable rods in said latter portions, fixedly-supported springs exerting a longitudinal action on said rods, and levers to which the wires are attached, said levers being pivoted to the ends of said rods and locked thereby when positioned to exert tension on the wires, substantially as set forth.

33. The combination with the reel having cross-bars, and the central stationary guide-bars, of the rings, revoluble around said guide-bars, having prongs, the radial cutting-wires

having looped ends engaging said prongs, and locking devices for the outer ends of the wires mounted on the cross-bars, and comprising each a rod spring-actuated longitudinally, and locking-levers, pivoted each to one end of each of such rods and having lateral projections near their pivot-bearings, to which the outer looped end of the respective cutting-wire is attached, substantially as set forth.

34. The combination with the reel, and the central stationary guide-bars, of the rings encircling said guide-bars, means for attaching the inner ends of the wires to said rings, means for yieldingly holding the outer ends of the wires to the reel, and a cutting-table having slots in its side and bottom terminating in openings in said sides, said wires and rings being designed to pass, respectively, through said slots and openings, as set forth.

35. The combination with the reel, and the central stationary bars, formed with grooves, of the rings encircling said bars and fitted in said grooves, said rings being formed with prongs, the cutting-wires engaging said prongs, spring-held holders for the outer ends of said wires, and a cutting-table having slots in its side and bottom terminating in openings in said sides, said wires and rings being designed to pass, respectively, through said slots and openings, as set forth.

36. The combination with the carriage, of a feed-belt, a drum actuated thereby, a cam-disk revoluble with said drum for moving said carriage forward in unison with the movement of the bar of clay, and upon the completion of such movement returning said carriage to its normal position, cutting mechanism, and means for automatically actuating the same during said forward movement of the carriage, as set forth.

37. The combination with the feed-belt and the carriage, of the belt-drum, the shaft therefor, a loosely-mounted cam-disk, a wheel fast to said cam-disk, said wheel being designed to be rotated by said drum-shaft, means for accelerating the rotation of said wheel and cam-disk, and means actuated by said cam-disk for moving said carriage, as set forth.

38. The combination with the feed-belt and the carriage, of the belt-drum, the shaft therefor, a disk fast on said shaft carrying a lug, a cam-disk, a wheel fast with said cam-disk and having a lug designed to be engaged by the former lug, means actuated by said cam-disk for moving the carriage, and independently-operated means for moving said wheel independently of the drum-shaft, as set forth.

39. The combination with the feed-belt and the carriage, of the feed-belt drum, the shaft therefor, a stationary elongated bearing, a disk fast on said shaft having a lug, a cam-disk loose on said bearing, a segmentally-toothed worm-wheel fast to said cam-disk, having a lug with which the former lug is designed to engage, and a constantly-operated shaft hav-



ing a worm for moving said worm-wheel and cam-disk at an accelerated speed independently of said former shaft, substantially as set forth.

5 40. The combination with the feed-belt and the carriage, of the feed-belt drum, the shaft therefor, an elongated stationary bearing for said shaft, a disk fast on said shaft having a lug, a disk loose on said bearing having cams  
10 on opposite sides, a segmentally-toothed worm-wheel fast to said cam-disk and having a lug with which the former lug is designed to engage, a yoke straddling said cam-disk having rollers designed to be engaged by said cams,

a connection between said yoke and the carriage, and a constantly-operated shaft having a cam for engaging said worm-wheel and moving the latter and the cam-disk independently of the drum-shaft, substantially as set forth. 15 20

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

EGBERT M. FREESE.

Witnesses:

CHAS. H. LONIUS,  
B. E. PLACE.