

(No Model.)

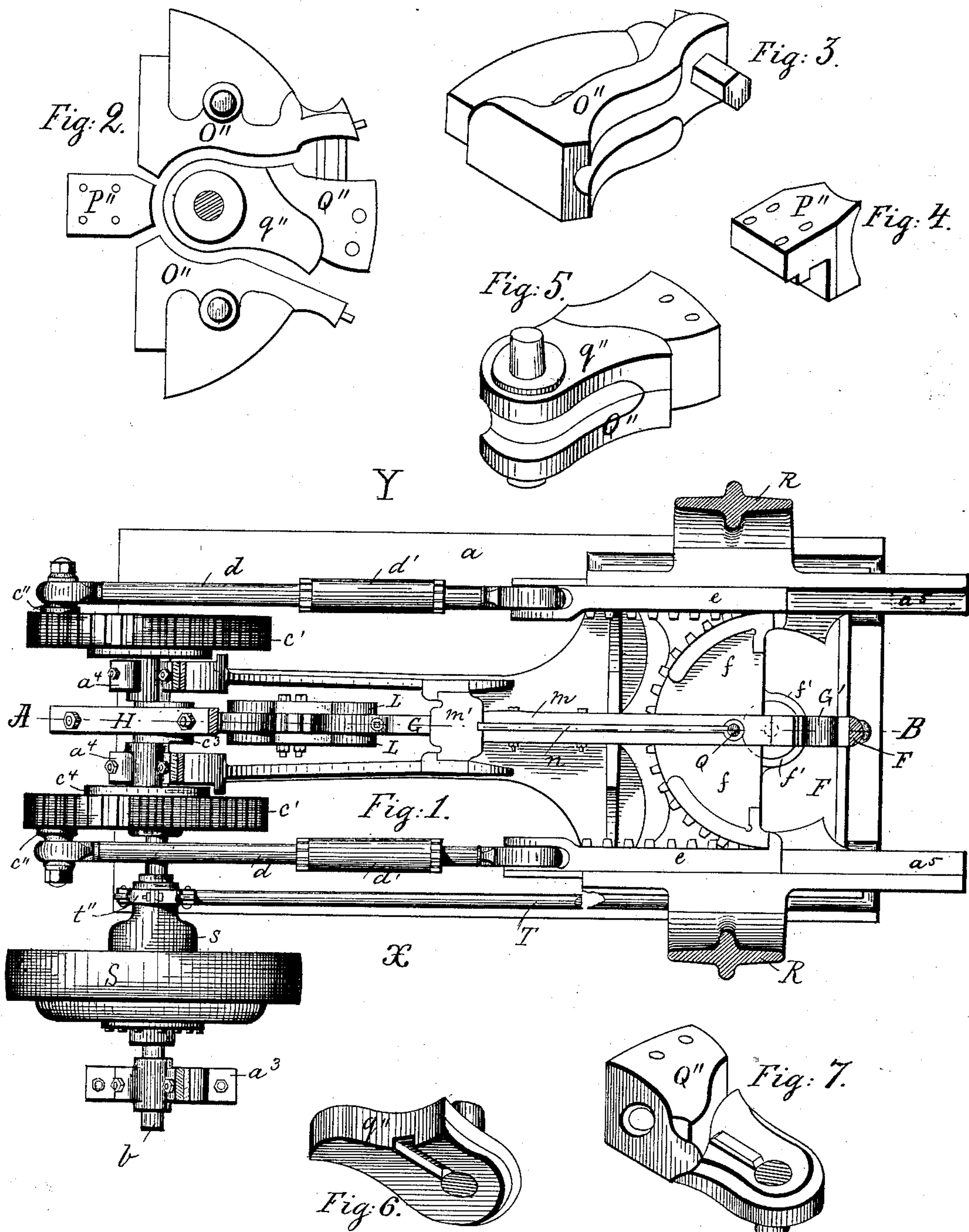
7 Sheets—Sheet 1.

E. FLETCHER.

MACHINE FOR FORMING TACKLE BLOCK STRAPS AND HOOKS.

No. 375,928.

Patented Jan. 3, 1888.



Witnesses:

Charlotte F. Torrey  
Henry Chadbourn.

Inventor:

Edward Fletcher.  
by Alban Judson, his atty

(No Model.)

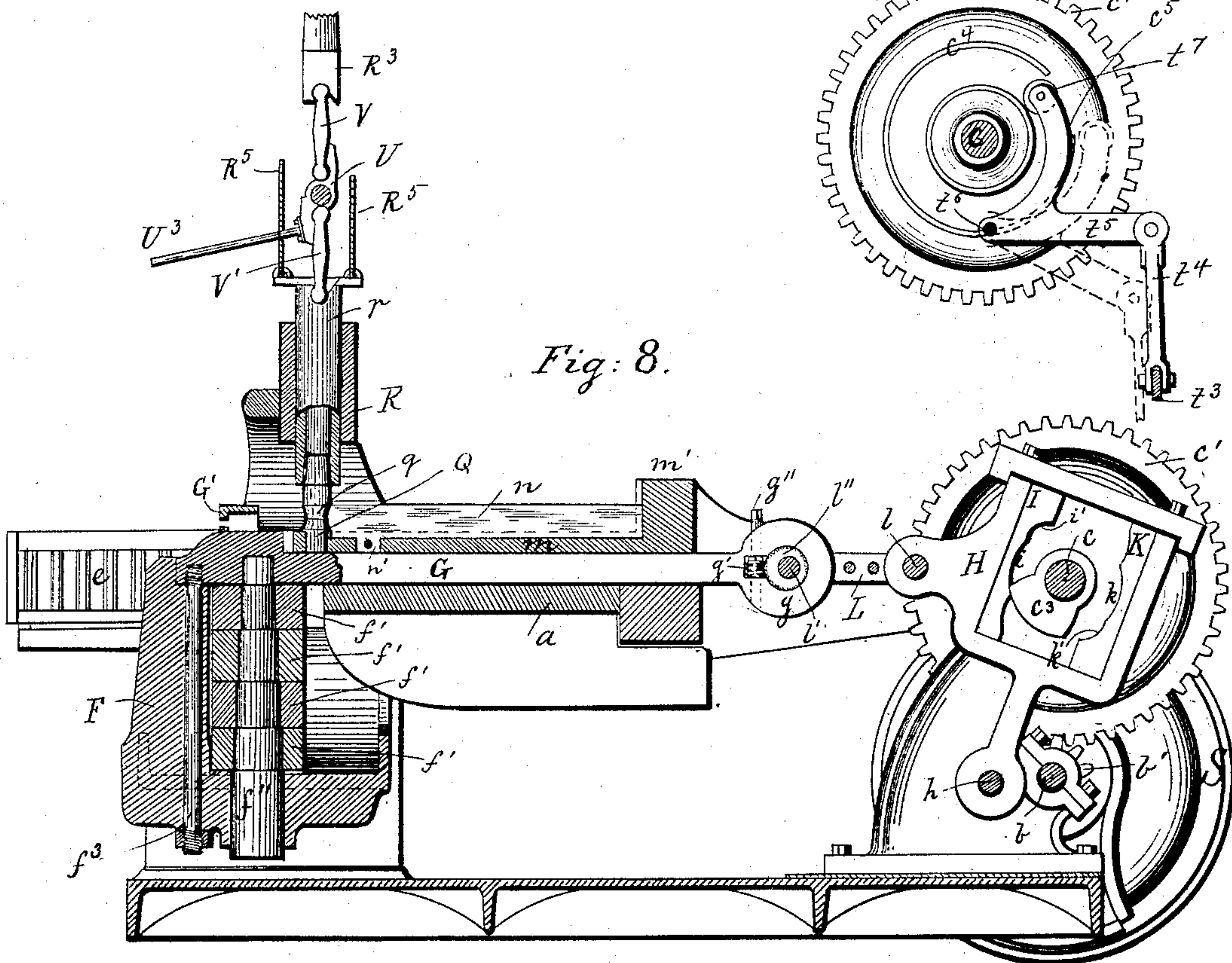
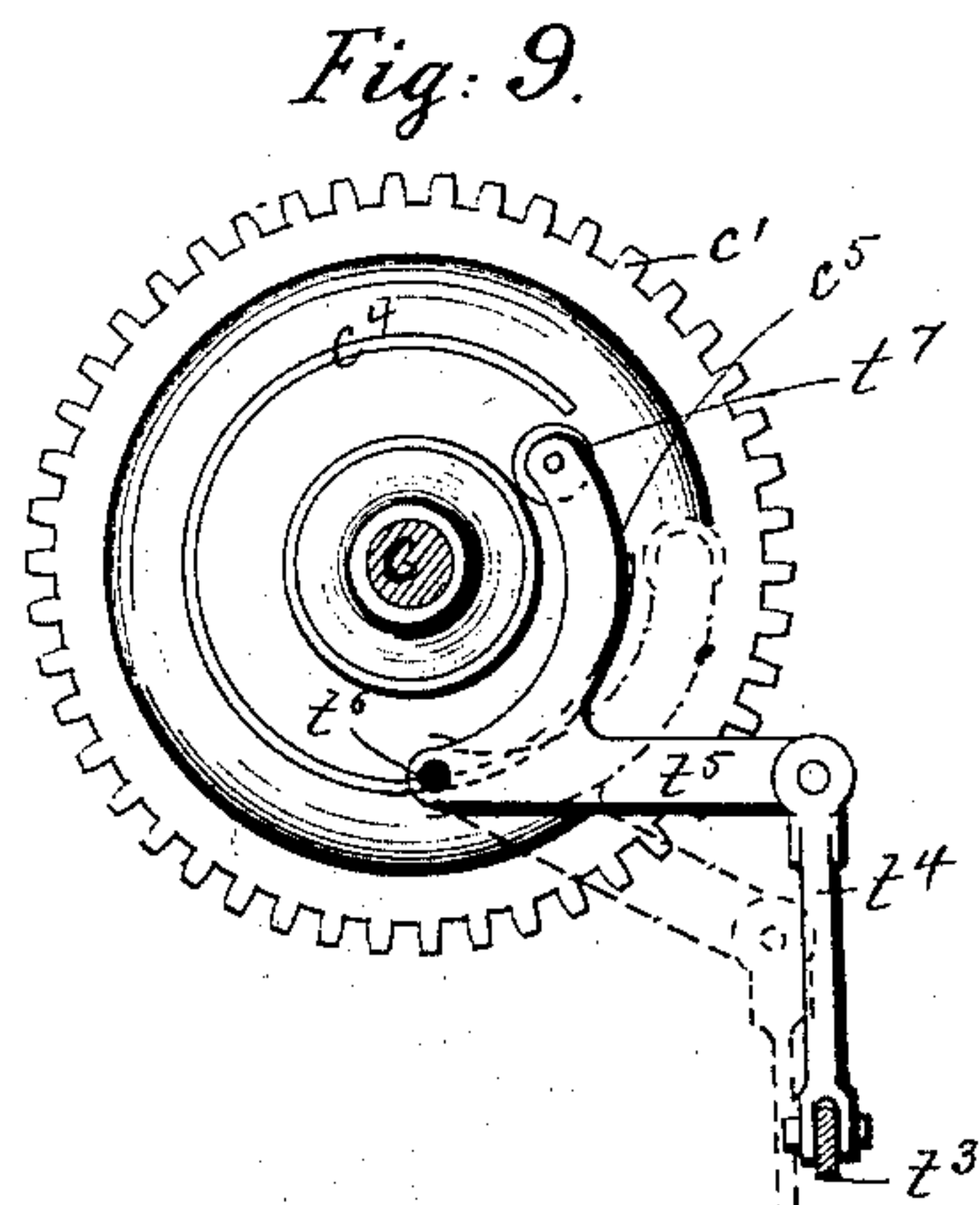
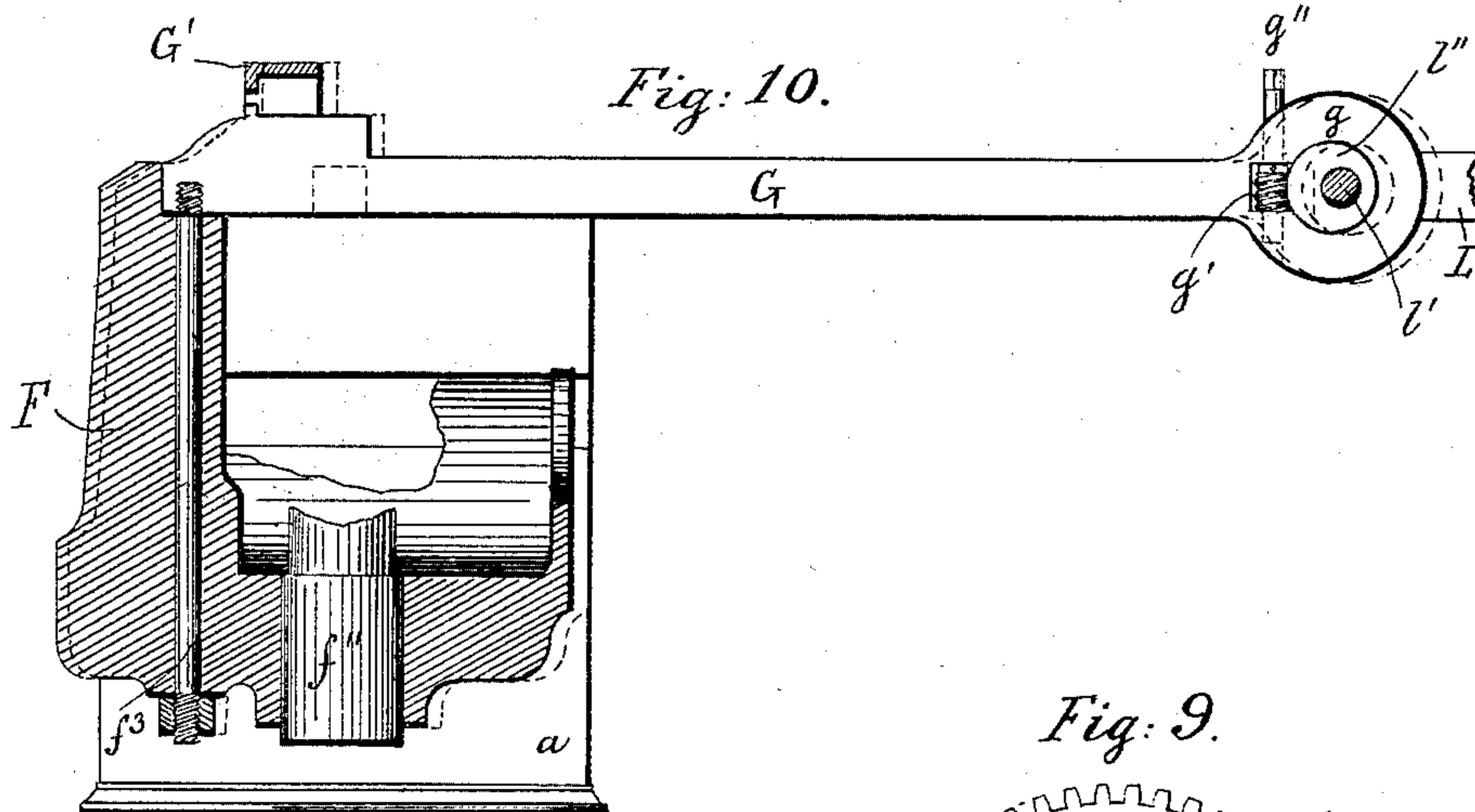
7 Sheets—Sheet 2.

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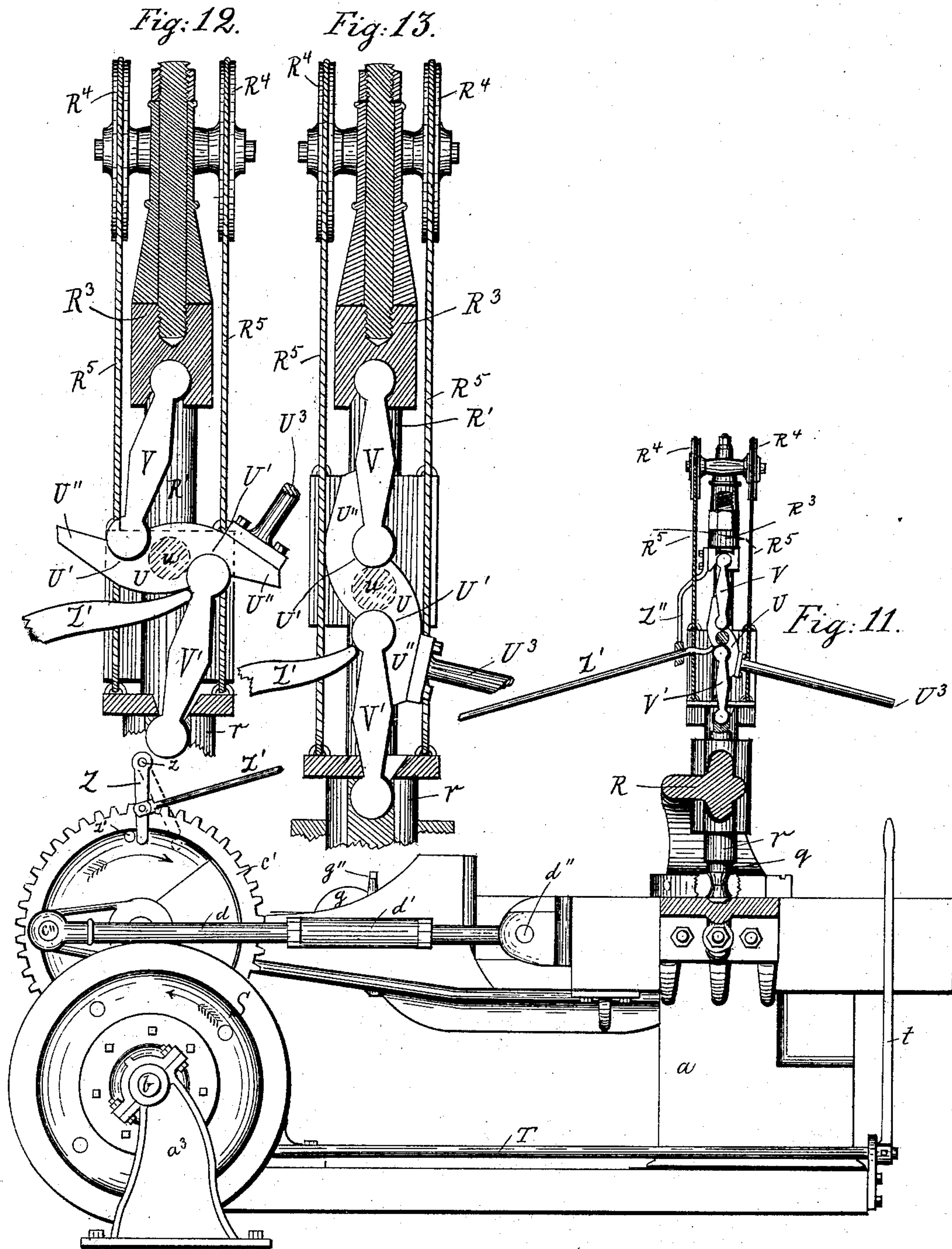
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7 Sheets—Sheet 4.

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MACHINE FOR FORMING TACKLE BLOCK STRAPS AND HOOKS.

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Fig. 15.

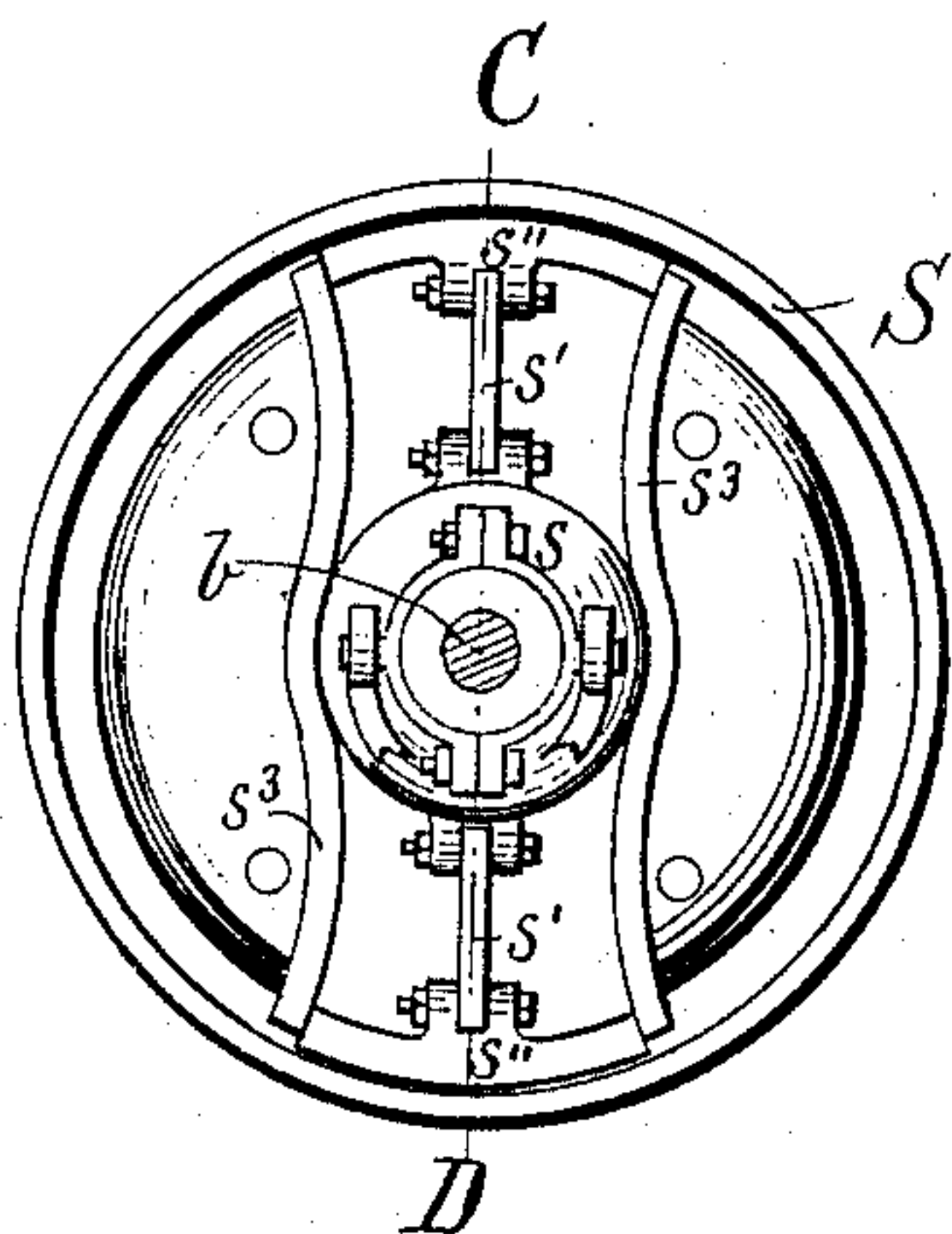


Fig. 16.

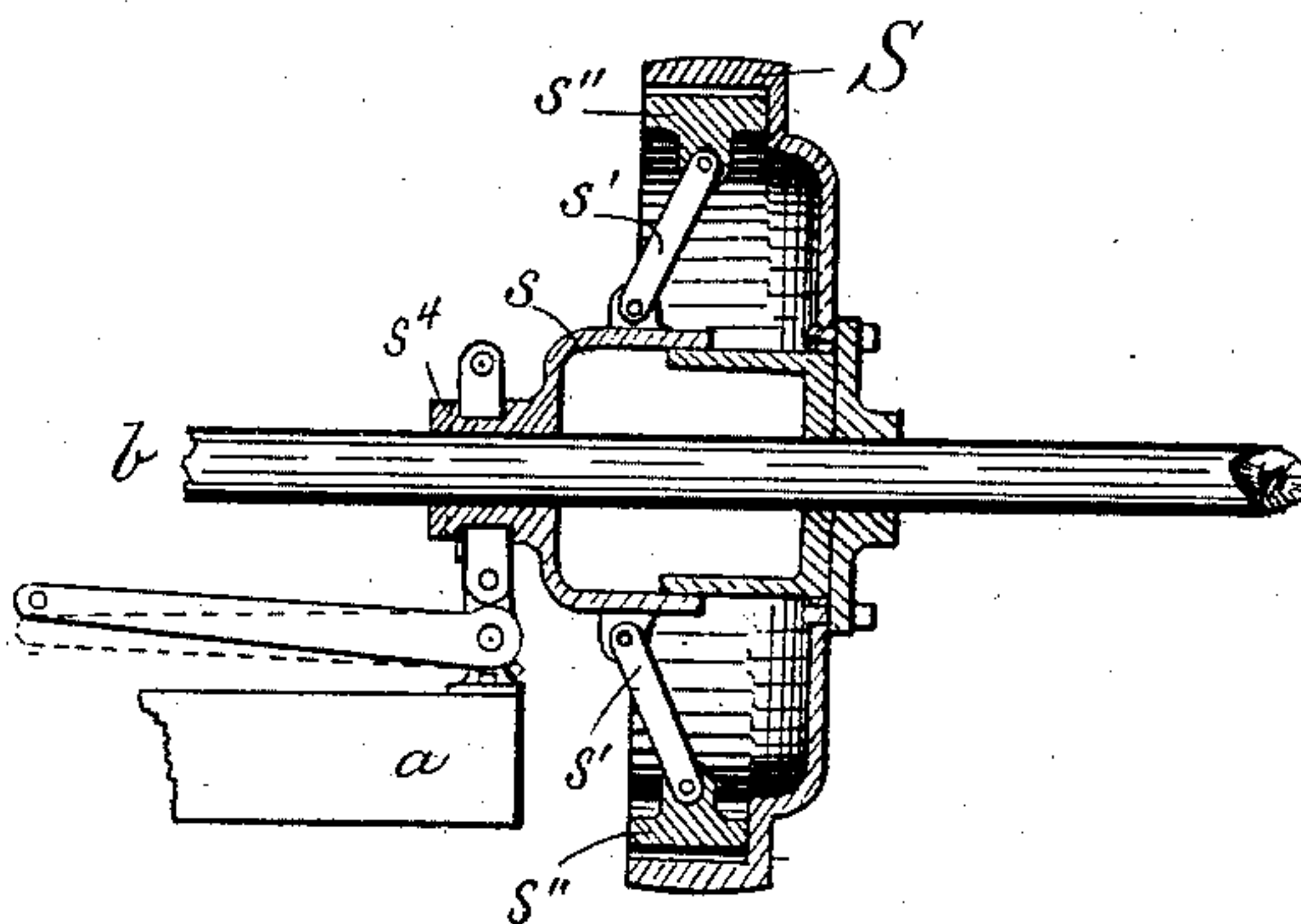
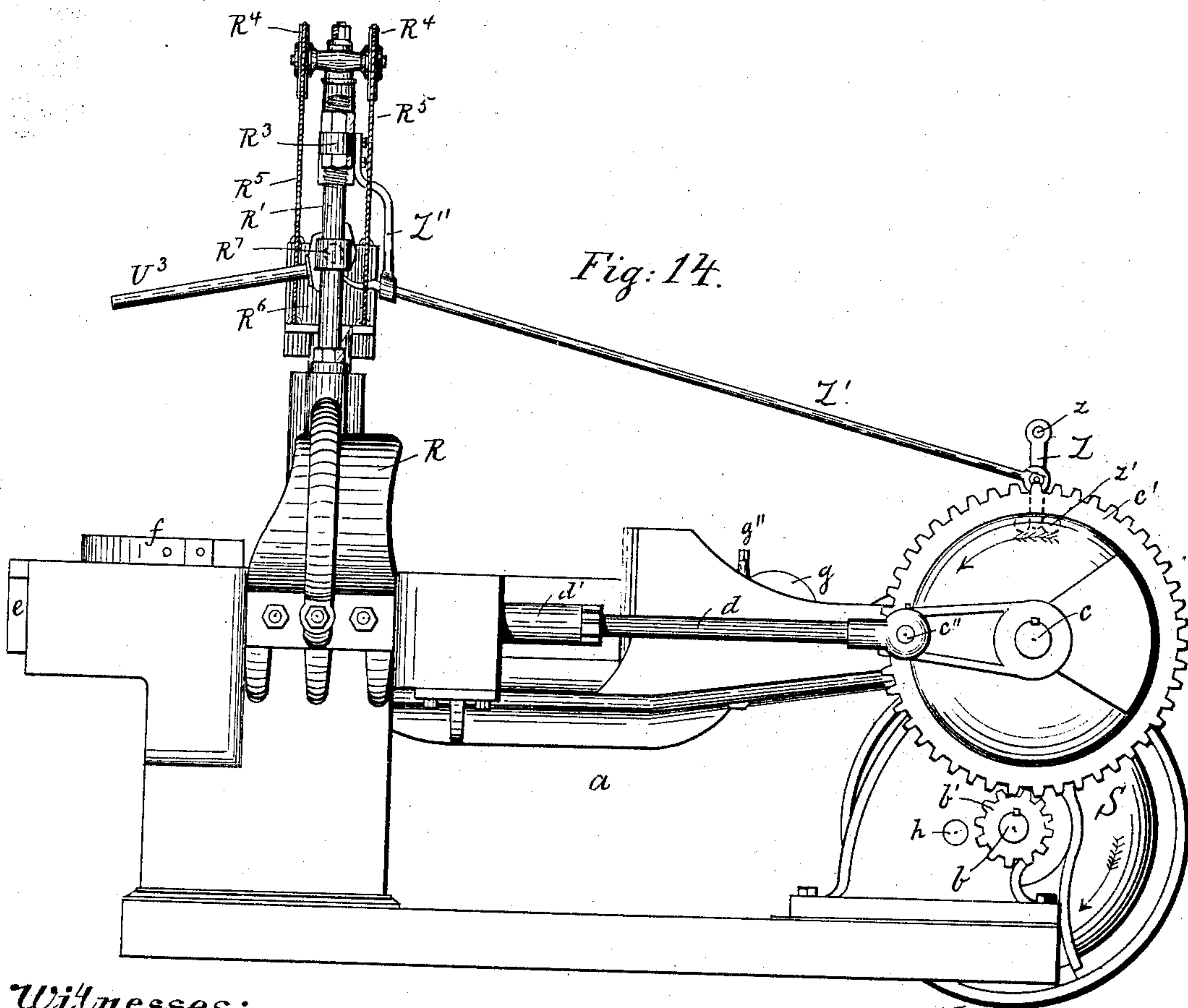


Fig. 14.



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(No Model.)

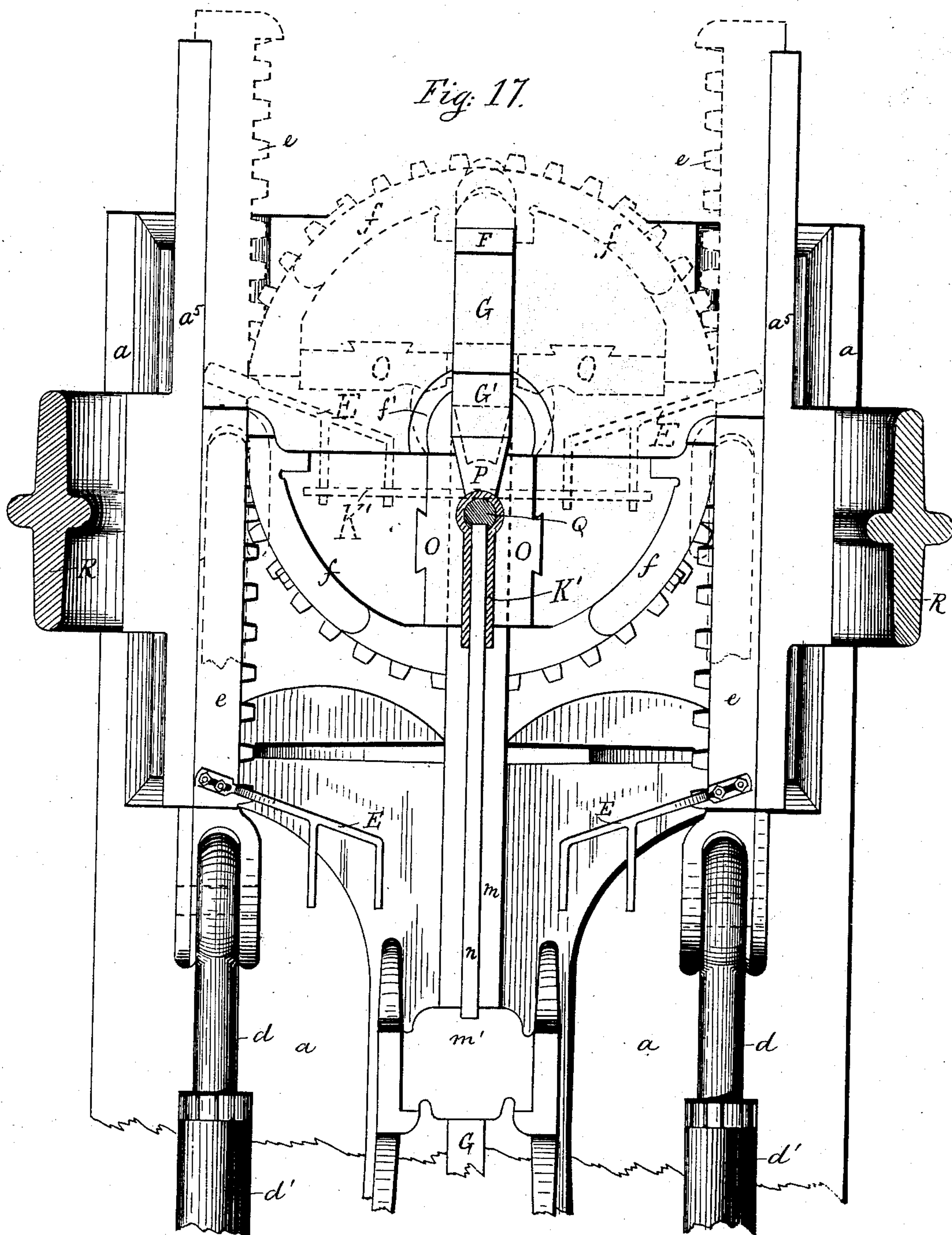
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E. FLETCHER.

MACHINE FOR FORMING TACKLE BLOCK STRAPS AND HOOKS.

No. 375,928.

Patented Jan. 3, 1888.



Witnesses:  
Charlotte F. Torrey  
Henry Chadbourne.

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(No Model.)

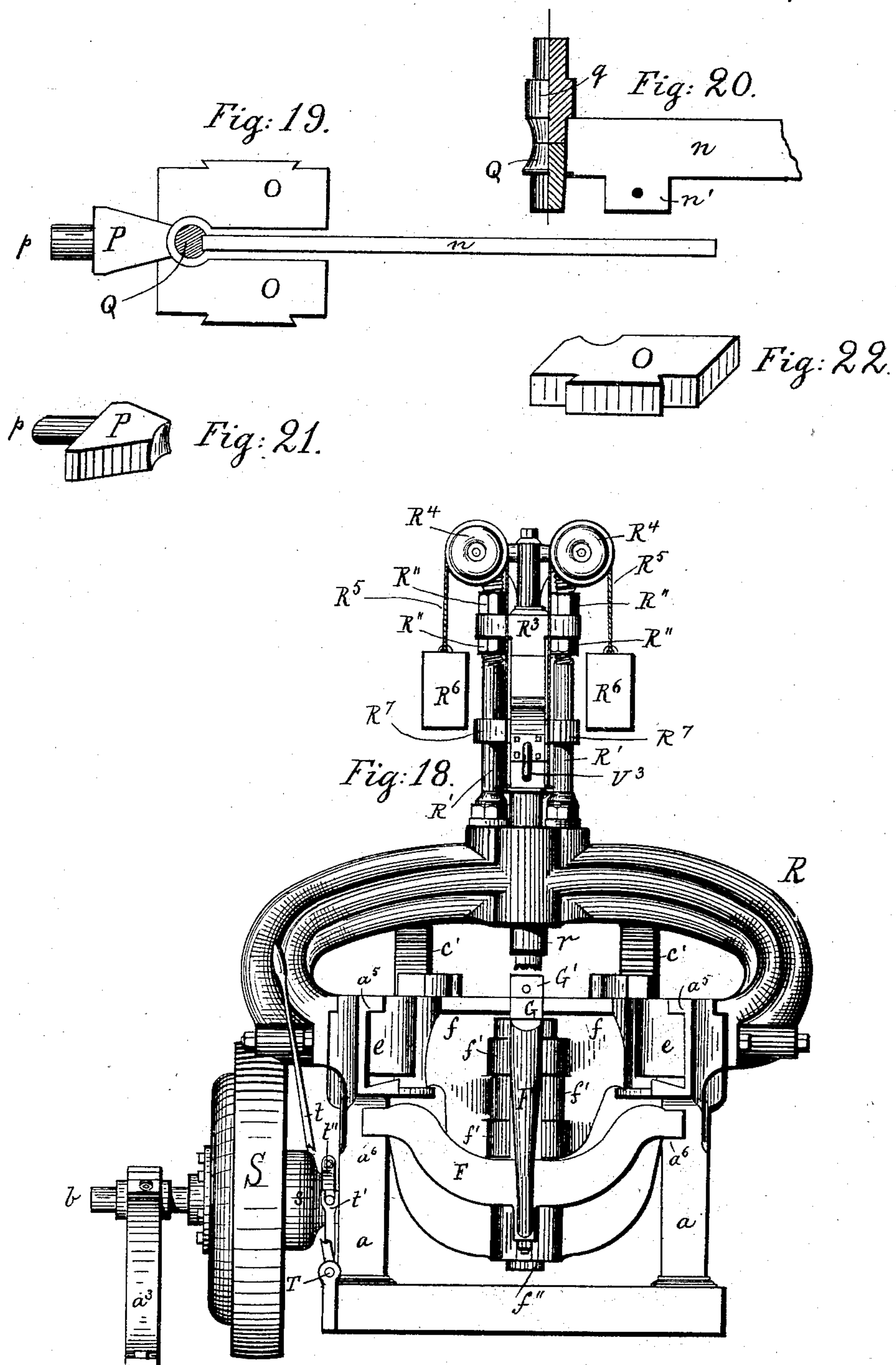
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E. FLETCHER.

# MACHINE FOR FORMING TACKLE BLOCK STRAPS AND HOOKS.

No. 375,928.

Patented Jan. 3, 1888.



Witnesses:  
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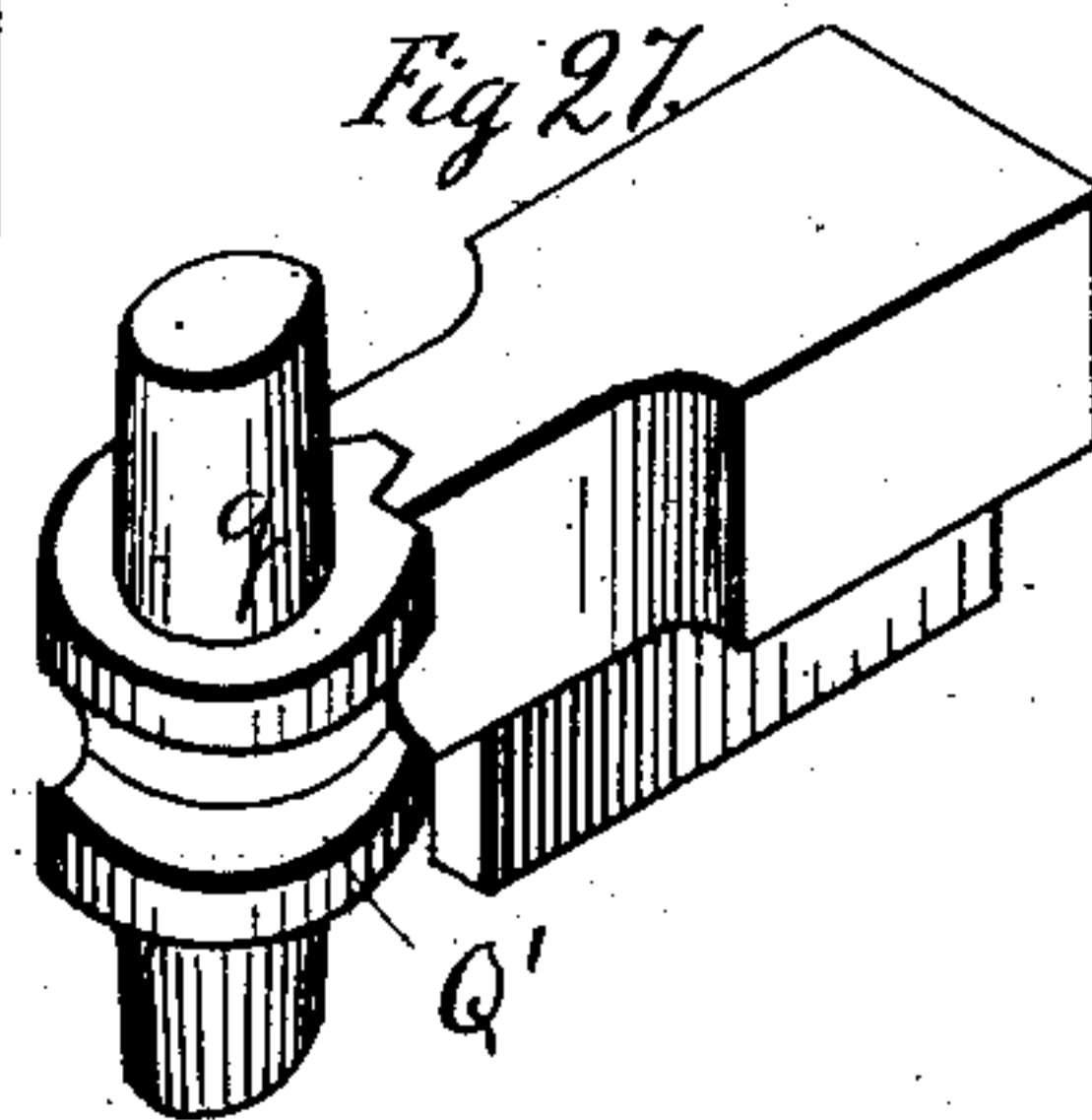
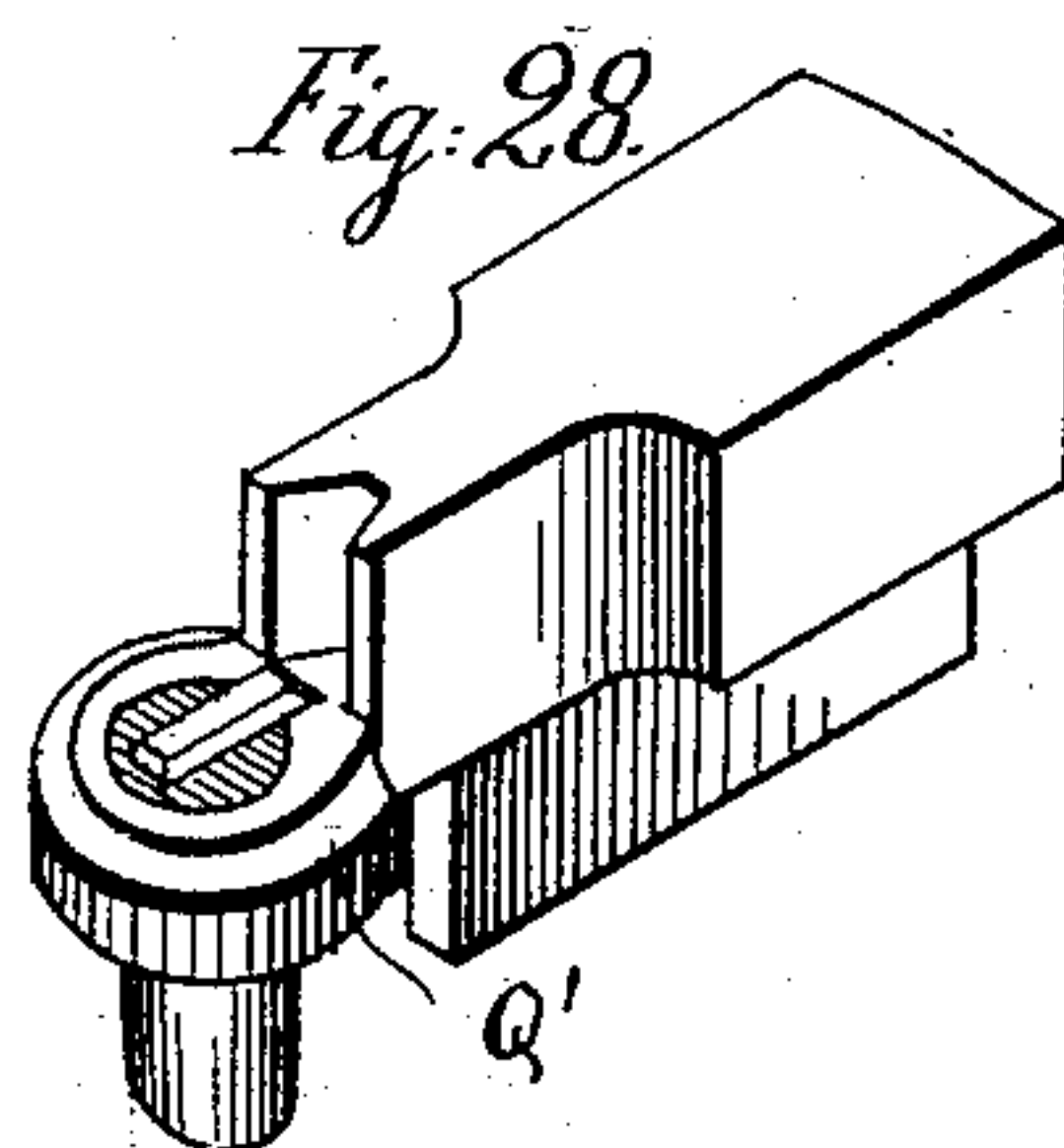
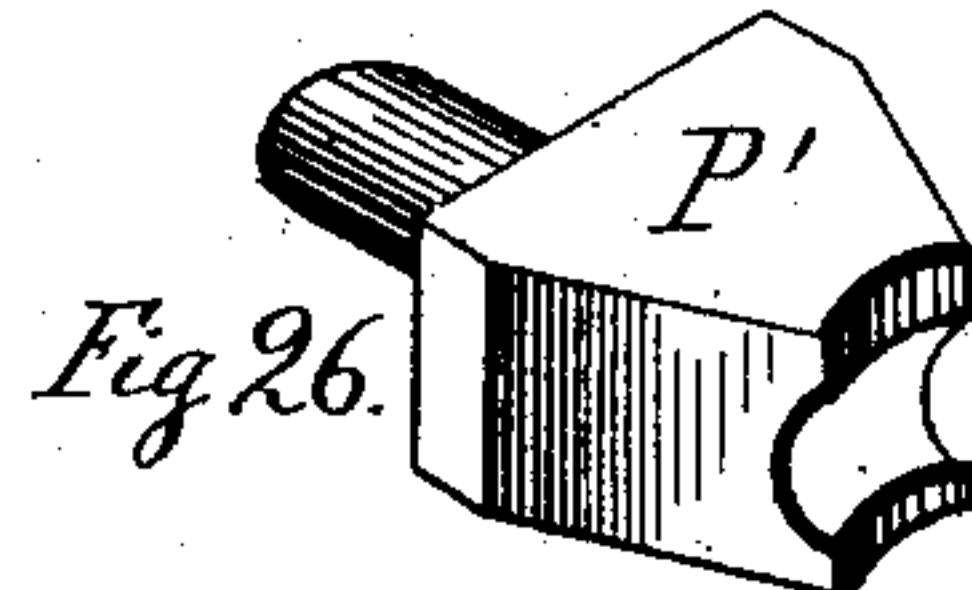
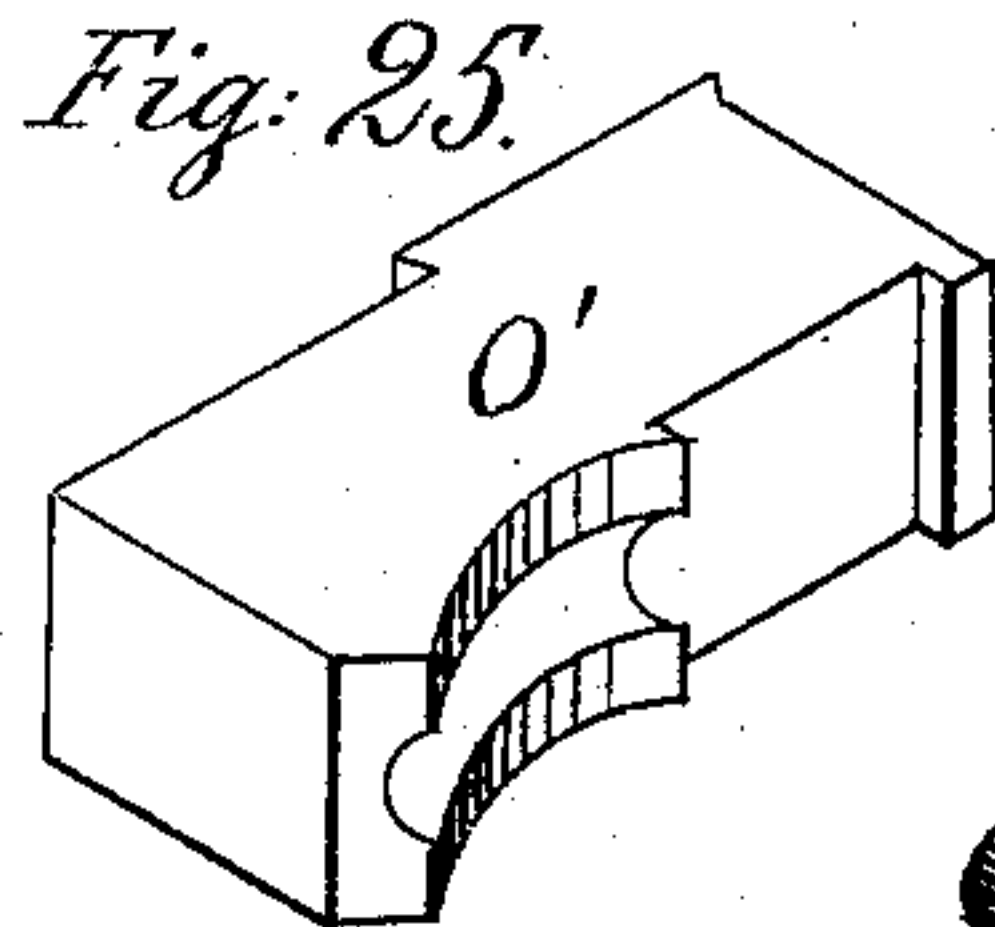
Inventor.  
Edward Fletcher.  
by Alban Andrews, his atty



- 7 Sheets—Sheet 7.

# MACHINE FOR FORMING TACKLE BLOCK STRAPS AND HOOKS.

Patented Jan. 3, 1888.



Inventor.  
Edward Fletcher.  
by Alban Andrien. his atty.



# UNITED STATES PATENT OFFICE.

EDWARD FLETCHER, OF PORTLAND, MAINE, ASSIGNOR TO HERBERT LOUD,  
OF EVERETT, MASSACHUSETTS.

## MACHINE FOR FORMING TACKLE-BLOCK STRAPS AND HOOKS.

SPECIFICATION forming part of Letters Patent No. 375,928, dated January 3, 1888.

Application filed February 7, 1887. Serial No. 236,863. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD FLETCHER, a citizen of the United States, and a resident of Portland, in the county of Cumberland and State of Maine, have invented new and useful Improvements in Forging-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in forging-machines for the purpose of automatically bending or shaping metal bars or pieces; and it is particularly designed for making block-straps, thimbles, hooks, and shackles, although it is equally useful for making links, horseshoes, or articles of a similar nature.

The invention is carried out as follows, reference being had to the accompanying drawings, where—

Figure 1 represents a plan view of the machine, showing the yoke as removed. Fig. 2 represents a plan view of the dies and filling-block used in the machines for making hooks. Fig. 3 represents a perspective view of one of the side dies. Fig. 4 is a perspective view of the back die. Fig. 5 is a perspective view of the filling-block or split die. Fig. 6 is the upper, and Fig. 7 is the lower, part of said filling-block or split die, all of the aforesaid dies being designed for forming hooks for blocks and hooks for other purposes. Fig. 8 represents a longitudinal section of the machine on the line A B, shown in Fig. 1. Fig. 9 represents a detail view of the cam-gear for operating the friction clutch to automatically stop the machine after a piece of work is finished. Fig. 10 represents a detail view of the draw-bar and its adjusting device. Fig. 11 represents a side elevation of the machine, as seen from X in Fig. 1, showing in section the top-die holding and releasing mechanism. Fig. 12 is a sectional detail view of the top-die holding and releasing device, as shown in position when the top die is raised; and Fig. 13 represents a sectional detail view of said device in position when the top die is lowered. Fig. 14 represents a side elevation of the machine, as seen from Y in Fig. 1. Fig. 15 represents an end view of the friction-clutch on the driving-shaft, and Fig. 16 represents a cross-section of the same on the line C D, shown in Fig. 15.

Fig. 17 represents a top view of the racks, quadrants, and the dies for forming block-straps. Fig. 18 represents a front view of the machine. Fig. 19 represents a detail top view of the strap-dies closed. Fig. 20 represents a detail view of the filling-block or split die and the top rib. Fig. 21 represents a perspective view of the back die, and Fig. 22 represents a perspective view of one of the side dies for forming block-straps. Fig. 23 represents a rear view of the machine. Fig. 24 represents a detail top view of shackle-dies. Fig. 25 represents a perspective view of one of the side shackle-dies. Fig. 26 represents a perspective view of the back shackle-die. Fig. 27 represents a perspective view of the shackle center die and filling-block or split die, and Fig. 28 represents a perspective view of the same, showing the upper part of filling-block or split die as removed.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

*a* is the frame of the machine, in one end of which is located the driving-shaft *b* in suitable bearings, *a' a''*, and an outside bearing, *a<sup>3</sup>*, as shown in Figs. 1 and 23. To shaft *b* is secured the pinions *b' b'*, gearing, respectively, in the gear-wheels *c' c'*, secured to the shaft *c*, that is located in the bearings *a<sup>4</sup> a<sup>4</sup>* on the frame *a*, as shown in said Figs. 1 and 23. To the outside of each gear-wheel *c'* is secured a crank-pin, *c'*, to which is hinged a connecting-rod, *d*, made in two parts and provided with an adjustable coupling, *d'*, by means of which the length of said rods *d d* can be adjusted according to the wear and adjustments of the parts that are operated by said rods. The forward ends of the rods *d d* are hinged at *d'' d''*, respectively, to the toothed racks *e e*, which latter are guided in grooves *a<sup>5</sup> a<sup>5</sup>* in the upper front portions of frame *a*, as shown in Figs. 1, 17, 18, and 23, and by this means a reciprocating motion is imparted to said racks from the driving-shaft *b* and crank-shaft *c*, for a purpose as will hereinafter be described. The toothed racks *e e* mesh into the toothed segments or quadrants *f f*, having hubs *f' f'* journaled upon the vertical quadrant pin or spindle *f''*, the lower end of which is secured to



the carriage F, which latter is adapted to slide parallel with the racks *ee* in grooves *a<sup>6</sup>* in frame *a*, as shown in Fig. 18. The forward and upper end of carriage F is secured to the forward end of the draw-bar G by means of bolt *f<sup>3</sup>*. (Shown in Figs. 8 and 10.) The upper end of the quadrant rod or spindle *f''* is made to project into a circular recess in the under side of the draw-bar G, as shown in Fig. 8.

The mechanism for imparting a forward-and-back sliding movement of the carriage F and quadrants *ff* from the crank-shaft *c* is carried out as follows: To the crank-shaft *c* is secured a cam, *c<sup>3</sup>*, (shown in Fig. 8,) and H is a frame or lever pivoted at *h* to the frame *a*, said frame or lever H being provided with a pair of cam-faces, I K, each one having two curves—namely, the respective long curves *i k* and the respective quick curves *i' k'*—as shown in Fig. 8. When the cam *c<sup>3</sup>* comes in contact with one of the quick curves *i' k'*, it causes the lever H to swing forward or back on its fulcrum *h*, as the case may be; but during the time the cam *c<sup>3</sup>* is in contact with the long curves *i k* the lever H is held stationary, for the reason that curvatures of the parts *i k* and the outer surface of the cam *c<sup>3</sup>* are equal.

It will thus be seen that the lever or frame H is rocked forward and back on its fulcrum *h* during the rotation of the shaft *c* in such a manner as to move quickly in one direction and then remain stationary until it is caused to swing quickly in an opposite direction, to remain for a time stationary, until it is again rocked in the direction first mentioned, and so on.

L L are a pair of links or rods pivoted in one end at *l* to the lever H, and in their other ends to the pin *l'*, the latter having secured to it the eccentric *l''*, (shown in Figs. 8 and 10,) which eccentric fits loosely in a circular perforation in the head *g* of the draw-bar G, the outer periphery of said eccentric being toothed and made to engage in the worm *g'*, attached to spindle *g''*, that is located in bearings in the draw-bar head *g*, as shown in said Figs. 8 and 10. By turning the worm *g'* around its axis the eccentric *l''* is turned in the head *g*, and by this means the position of the draw-bar G relative to the lever or frame H and crank-shaft *c* is adjusted so as to properly time the motion of the draw-bar relative to that of the quadrants *ff*.

The draw-bar G is free to move forward and back in a longitudinal guide or recess between the frame *a* and cap-plate *m*, as shown in Fig. 8.

*n*, in Figs. 1, 8, 17, 19, and 20, is the top rib, its lower side resting in a groove in the upper side of cap-plate *m* and secured to the latter by a pin passing through the projection *n'*, that is held in a perforation in the plate *m*, as shown in Fig. 8. The rear end of the top rib, *n*, rests in a groove in the head *m'* of the cap-plate *m*. (Shown in Fig. 8.) The forward end of the top rib, *n*, rests against the rear side of the filling-block or split die, as will hereinafter be more

fully described, for the purpose of relieving the strain on said split die while the article is being forged.

For forging or bending block-straps I secure to the upper side of the quadrants *ff* in a suitable manner the side dies, O O, shown in Figs. 17 and 19, and to the front end of the draw-bar G the back die, P, (shown in said figures,) the latter being preferably provided with a projection, *p*, adapted to fit in a corresponding recess in the projection or rest *G'* on the forward end of the draw-bar G. (Shown in Figs. 1, 8, 10, and 17.)

The filling-block or split die is made in two parts, Q *q*, the former, the lower one, being secured to the cap-plate *m*, as shown in Fig. 8, and the part *q*, being the upper one, is secured to the vertically-movable cylinder or rod *r*, that is vertically adjustable in a central perforation in the yoke R, secured to the upper part of frame *a*, as shown in Figs. 8, 11, 18, and 23.

Where the interior surface of the eye of the piece that is to be bent is flaring or rounded from the middle toward the upper and lower sides, it is necessary to have the filling-block or split die made in the form of a pair of tapering dies, one of which may be moved away from the other to admit of the removal of the forging after it is finished; but when the forging has not such flaring or rounded interior surfaces the lower filling-block only need to be used and the upper one may be dispensed with. According to the shape and nature of the articles to be bent or formed, the dies are varied. For instance, for making shackles for blocks, I use dies as shown in Figs. 24, 25, 26, 27, and 28, in which O' O' are the side dies, secured to the quadrants *ff*. P' is the back die, and Q' *q'* are the split dies or filling-block.

For making hooks for blocks and other purposes, I make the dies of the forms and shapes shown in Figs. 2, 3, 4, 5, 6, and 7, in which O'' O'' are the side dies, secured to quadrants *ff*. P'' is the back die, and Q'' *q''* are the split dies or filling-block, one part of which is secured to the cap-plate *m* and the other to the vertically-adjustable rod or cylinder *r* in the same manner as heretofore described relative to the mode of making block-straps.

In connection with the machine I use a starting device and automatic stop mechanism for automatically stopping the machine after the crank-gears have made one revolution, and this is carried out as follows:

On the driving-shaft *b* is loosely journaled the driving-pulley S, (shown in detail in Figs. 15 and 16,) and on the shaft *b* is splined the friction-clutch hub *s*, that is adjustable to and from the pulley S by lever mechanism, hereinafter to be described. The pulley S is continuously rotated by means of belt-power, as usual. To the hub *s* are hinged the links *s' s'*, the outer ends of which are hinged, respectively, to the friction-clutch blocks *s'' s''*, which are capable of radial adjustments between the guides *s<sup>3</sup> s<sup>3</sup>*, attached to or forming a part of



the hub *s*, as shown in Fig. 15. By moving the hub *s* toward the pulley *S* the blocks *s'' s''* are forced against the interior periphery of the said pulley, thereby causing it and the hub *s* to be frictionally held together, by which the rotary motion of the pulley *S* is transmitted to the driving-shaft *b* and the parts driven by it. By drawing the hub *s* away from pulley *S* the blocks *s'' s''* are liberated from pulley *S*, and consequently the latter may continue its rotation without imparting motion to hub *s* and shaft *b*.

The hub *s* is moved on shaft *b* toward the pulley *S* by the following means: In bearings attached to frame *a* is located the rock-shaft *T*, (shown in Figs. 11, 18, and 23,) and to the forward end of said shaft is secured the hand-lever *t*, (shown in Figs. 11 and 18,) which the operator takes hold of and swings to the left when the machine is to be started. To the rear end of shaft *T* is secured a forked lever, *t'*, (shown in Fig. 23,) that is pivoted to a ring, *t''*, located in an annular groove, *s'*, in the hub *s*, as shown in Figs. 15 and 16. For the purpose of automatically stopping the machine after the crank-gears *c' c'* have performed one revolution, I employ the following mechanism: To rock shaft *T*, I secure a lever, *t<sup>3</sup>*, the outer end of which is hinged to the lower end of the link *t<sup>4</sup>*, (shown in Figs. 9 and 23,) the upper end of which is hinged to the rear end of the bell-crank lever *t<sup>5</sup>*, that is supported on the stationary fulcrum-pin *t<sup>6</sup>*. (Shown in Fig. 9) The upper end of the bell crank lever *t<sup>5</sup>* has pivoted to it the small roller *t<sup>7</sup>*. (Shown in Figs. 9 and 23.) On the inside of one of the gear-wheels *c'* is a concentric ring or flange, *c<sup>4</sup>*, having at one place on its circumference an opening, *c<sup>5</sup>*. (Shown in Fig. 9.) In starting the machine, by moving the lever *t* toward the left, as shown in Fig. 18, the roller *t<sup>7</sup>* is moved through opening *c<sup>5</sup>* to a position inside of the ring *c<sup>4</sup>*, as shown in Fig. 9, and it will continue to remain in such position until the axle *c* has completed a revolution, or nearly so, when the roller *t<sup>7</sup>* will move out of the opening *c<sup>5</sup>*, and the bell crank lever *t<sup>5</sup>* will be caused to swing to the position shown in dotted lines in Fig. 9, which movement is produced by the weight of bell crank lever *t<sup>5</sup>*, link *t<sup>4</sup>*, and lever *t<sup>3</sup>*, or by a suitable weight attached to either of them, and during such motion the hub *s* will automatically be moved from the pulley *S*, and the friction-blocks *s'' s''* liberated from contact with the inner periphery of said pulley *S* by the connecting mechanism, viz: lever *t<sup>3</sup>*, rock-shaft *T*, rock-lever *t'*, and ring *t''*, connected to hub *s*, as above described, and in this manner and by these means the gear-wheels *c' c'* will be automatically stopped after making one revolution.

In connection with the machine I also use mechanism for raising and lowering the cylinder *r* and the upper filling-block or split die, *q*, and this is carried out as follows: To the top of the yoke *R*, on either side of the cylinder *r*, are secured the vertical rods or standards *R'*

*R'*, (shown in Figs. 11, 14, and 18,) to the upper ends of which is secured, by means of adjustable set screws *R'' R''*, the head *R<sup>3</sup>*, in the upper ends of which are journaled the grooved rollers *R<sup>4</sup> R<sup>4</sup>*, carrying the cords, belts, or chains *R<sup>5</sup> R<sup>5</sup>*, the inner ends of which are secured to the upper end of the cylinder *r*, and the outer ends secured to weights *R<sup>6</sup> R<sup>6</sup>*, sufficiently heavy to cause the cylinder *r* and its filling-block *q* to be automatically raised to the desired position for removing the forging after being finished. For the purpose of forcing the cylinder *r* and the upper filling-block, *q*, downward, and to hold them in the positions shown in Figs. 8 and 11, I arrange upon the standards *R' R'* a vertically-movable block, *R<sup>7</sup>*, to which is pivoted at *u* the tripping-lever *U*, having upper and lower notches, *U' U'*, in which are resting the respective ends of the links or levers *V* and *V'*, as shown in detail in Figs. 12 and 13. The upper end of the link *V* is pivoted in a corresponding recess in the under side of the head *R<sup>3</sup>*, and the lower end of link *V'* is pivoted in a similar recess in top of cylinder *r*, as shown in said Figs. 12 and 13.

*U'' U''* are stop projections on the tripping-lever *U*, as shown in said Figs. 12 and 13, which are brought against opposite sides of the respective levers *V V'* when the tripping-lever *U* is turned to the position shown in Figs. 11 and 13, in which position the cylinder *r* and the filling-block *q* are forced downward, so that the latter impinges and rests against the lower filling-block, *Q*, as shown in Figs. 8 and 11.

The tripping-lever *U* may be operated by hand by means of a suitable handle, *U<sup>3</sup>*, secured to said lever *U*, as shown in Figs. 8, 11, 12, 13, 14, and 18.

When it is desired to raise the cylinder *r* and its filling-block *q*, all that it is necessary to do is to swing the lever *U* and links or levers *V V'* to the position shown in Fig. 12, when the weights *R<sup>6</sup>*, pulleys *R<sup>4</sup>*, and cords or chains *R<sup>5</sup>* will cause the cylinder *r* and filling-block or split die *q* to be raised sufficiently to permit the removal of the finished forging.

When forging or bending articles in which the eye has vertical inner sides, the upper filling-block, *q*, may be dispensed with, in which case the cylinder *r* is to be kept raised during the running of the machine. For the purpose of automatically raising the cylinder *r* and its filling-block *q*, after the article to be forged is finished, I use an automatic device, as shown in Figs. 11 and 14, and it consists of an arm or lever, *Z*, suspended on a stationary fulcrum, *z*, (shown in said figures,) which lever is actuated by a projection or stud, *Z'*, attached to one of the gear-wheels *c'*. To the lever *Z* is hinged the rear end of the tripping-rod *Z'*, the forward or upper end of which may be arranged to act on the tripping-lever *U* or link *V* either by butting against one of said parts, as shown in Figs. 11, 12, 13, and 14, or said upper end may be hinged to one or the other of said parts. When made to butt against the



levers U or V', a suitable guide-rod, Z'', is secured to the head R<sup>3</sup>, in which the upper end of the rod Z' is guided, as shown in Figs. 11 and 14. During the rotation of the gear-wheel 5 c' the projection z' trips the lever Z, causing the rod Z' to turn the lever U to the position shown in Fig. 12, by which the same effect is produced automatically as if the lever U had been tripped by hand by actuating the hand-lever U<sup>3</sup>. The dotted lines in Fig. 10 show the 10 positions of the draw-bar G and carriage F when said parts are drawn backward by the agency of cam c<sup>3</sup> and rocking frame or lever H.

In Fig. 17 the dotted lines show the positions of the racks e e and quadrants f f when moved toward the operator in position ready to receive the article to be bent or forged, and the full lines in said figure indicate the positions of the parts when completing the operation of forging or bending the desired article. In said Fig. 17, E E represent suitable rests secured in an adjustable manner by means of 20 screws or similar devices to the racks e e.

K', in dotted lines in Fig. 17, represents the metal blank or bar as resting on the supports 25 E E previous to setting the machine in motion, and the same letter, K', in full sectional lines represents the finished forging after being bent and shaped by the dies O O P, filling-block or split dies q Q, and backing-rib n. 30

The operation of the machine is as follows: Before starting the machine the side dies, O O, and quadrants f f are open, as shown in dotted lines in Fig. 17, and the back die, P, is moved 35 toward the operator, as shown in dotted lines in said figure. The upper filling block, q, is then lowered, so as to rest on the lower filling-block, Q, as and for the purpose set forth. The metal blank K' after being properly heated is then 40 laid on the rests E E, as shown in dotted lines in said figure. The machine is now set in motion by means of the lever t and clutch mechanism, as described, causing first the back die, P, and carriage F to move forward by the action of cam c<sup>3</sup> on the quick curve k' in swing- 45 ing frame H, by which the middle portion of the blank is compressed and held between the back die, P, and filling-block or split die q Q, and during this part of the operation the quadrant-pin f'', carriage F, and back die, P, are 50 carried backward to the full extent of their motion in this direction; and during such backward motion of said parts the quadrants f f move backward an equal distance, but do not revolve. As soon as the back die, P, and carriage F stop the quadrants f f begin to turn a 55 quarter of a revolution around the quadrant pin or bolt f'' by the action of the cranks c'' c'', rods d d, and racks e e, thereby causing the side dies, O O, to gradually bend the strap or blank K' around the filling-block or split dies q Q, and to close the sides or ends of the blanks against the backing-rib n, as shown in full lines in Fig. 17. During the further rotation 60 of the gears c' c' the quadrants f f commence gradually to open, so as to relieve the pressure of the side dies, O O, on the sides of the

now finished forging, and after such pressure is relieved the back die, P, carriage F, and quadrant-bolt f'' are moved forward to their 70 original positions by the action of cam c<sup>3</sup> on the quick-return curve i' in rocking frame H, and the quadrants f f are simultaneously moved forward and turned full open to the positions shown in dotted lines in Fig. 17, 75 when the machine is automatically stopped by the automatic stop mechanism heretofore fully described. The upper filling-block, q, is then raised by manipulating the lever U<sup>3</sup> or by the automatic mechanism described, and 80 the finished forging removed and another blank placed in position on the machine, and so on.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim— 85

1. In a machine for forming tackle-block straps and hooks, the die carrying quadrants f f, having an oscillating and forward-and-back motion, the filling-block Q, and reciprocary carriage F, and back die carrying draw-bar G, arranged and combined as and for the purpose set forth and described. 90

2. In a machine for forming tackle-block straps and hooks, the oscillating and reciprocary side die carrying quadrants f f, reciprocary carriage F, and back die carrying draw-bar G, the lower stationary filling-block, Q, vertically-adjustable filling-block q, and stationary top rib, n, arranged and combined to operate as and for the purpose set forth. 100

3. In a machine for forming tackle-block straps and hooks, the frame a, reciprocary toothed racks e e, the toothed quadrants f f, with their dies O O, the reciprocary carriage F, the reciprocary draw-bar G and its back 105 die, P, the filling-block Q, and stationary top rib, n, arranged and combined to operate as and for the purpose set forth.

4. In a machine for forming tackle-block straps and hooks, the reciprocary carriage 110 F and draw-bar G, secured together, combined with the quadrant-bolt f'', and quadrants f f, journaled upon said bolt, as and for the purpose set forth.

5. In a machine for forming tackle-block 115 straps and hooks, the mechanism for reciprocating the carriage F, draw-bar G, quadrant-bolt f'', and quadrants f f, consisting of the rotary shaft c and cam c<sup>3</sup>, secured to it, the rocking frame or lever H, having the blocks I K, 120 and link L, connecting the draw-bar to the lever H, as and for the purpose set forth.

6. In a machine for forming tackle-block straps and hooks, the device for adjusting the position of draw-bar G, consisting of the spin- 125 dle l', pivoted to link L, and provided with the toothed eccentric l'', arranged in a recess in the draw-bar head g, and spindle g'', with its worm g' arranged to turn in said head g and adapted to engage in the toothed eccentric l'', 130 as and for the purpose set forth.

7. In a machine for forming tackle-block straps and hooks, the rotary shaft c and its cam c<sup>3</sup>, for intermittently reciprocating the back



die carrying draw-bar G, and toothed quadrants  $f f$ , combined with rotary gear-wheels  $c'$   $c'$ , secured to shaft  $c$  and having cranks  $c'' c''$ , hinged to rods  $d d$ , and racks  $e e$ , connected to the latter and adapted to engage in the teeth on the quadrants  $f f$ , as and for the purpose set forth.

8. In a machine for forming tackle-block straps and hooks, the mechanism for starting and automatically stopping the machine at the completion of its operation, consisting of shipper-lever  $t$ , shaft T, having lever  $t'$  for actuating the friction clutch-blocks  $s'' s''$  against the rotary pulley S, and lever  $t^3$ , and connecting mechanism to the bell-crank lever  $t^5$ , the roller  $t^7$ , journaled to the latter, and ring  $c^4$ , open at one place,  $c^5$ , and arranged on the side of one of the gear-wheels  $c' c'$ , as and for the purpose herein set forth and described.

9. In a machine for forming tackle-block straps and hooks, the lower stationary filling-block, Q, combined with the vertically-movable block  $q$ , secured to the lower end of the rod  $r$ , the latter being located in yoke R, secured to frame  $a$ , as and for the purpose set forth.

10. In a machine for forming tackle-block straps and hooks, the stationary yoke R and rod  $r$ , carrying the filling-block  $q$ , as described, combined with standards  $R' R'$ , pulleys  $R^4 R^4$ , chains or cords  $R^5$ , and weights  $R^6 R^6$ , arranged,

as described, for raising the said filling-block  $q$  to permit of the removal of the finished forging, substantially as described.

11. In a machine for forming tackle-block straps and hooks, the herein-described device for depressing the upper filling-block,  $q$ , consisting of the tripper-lever U, having recesses  $U' U'$  and stop projections  $U'' U''$ , combined with handle  $U^3$ , and levers or links  $V V'$ , connected, respectively, to stationary head  $R^3$  and rod  $r$  and having their inner ends resting in the recesses  $U''$  on lever U, as and for the purpose set forth.

12. In a machine for forming tackle-block straps and hooks, the combination, with the trip-lever U and links  $V V'$ , of the automatic mechanism for tripping said lever or said links, consisting of the rotary gear-wheel  $c'$ , having the projection  $z'$ , and the arm or lever Z, hung on fulcrum  $z$  and having hinged to it the rod  $Z'$ , adapted to act on said lever or links, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 6th day of September, A. D. 1886.

EDWARD FLETCHER.

Witnesses:

BENJ. THOMPSON,  
GEO. F. GOULD.