

**No. 673,559.**

**Patented May 7, 1901.**

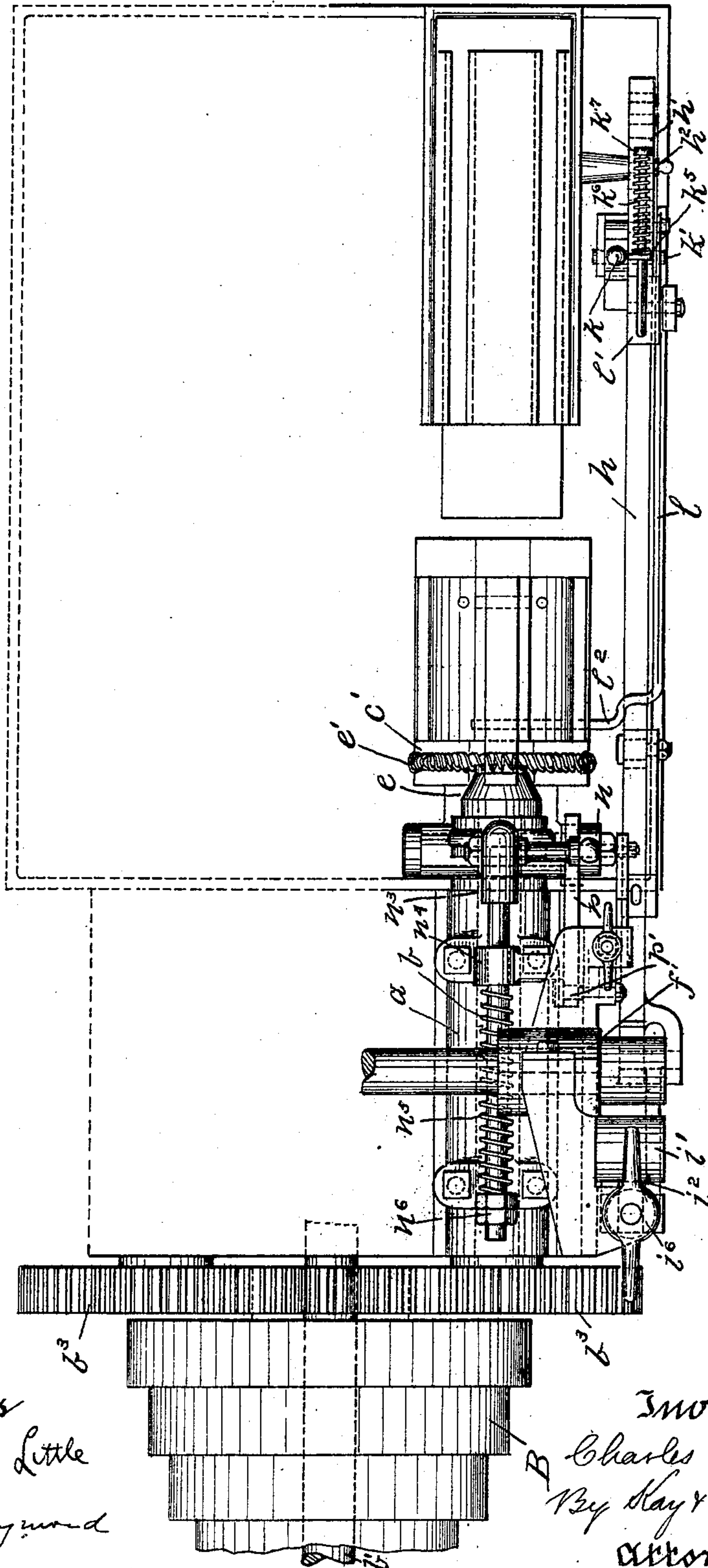
**C. LANZ.**

## BOLT THREADING MACHINE.

(Application filed Aug. 14, 1899.)

(No Model.)

**5 Sheets—Sheet 1.**



98 witnesses  
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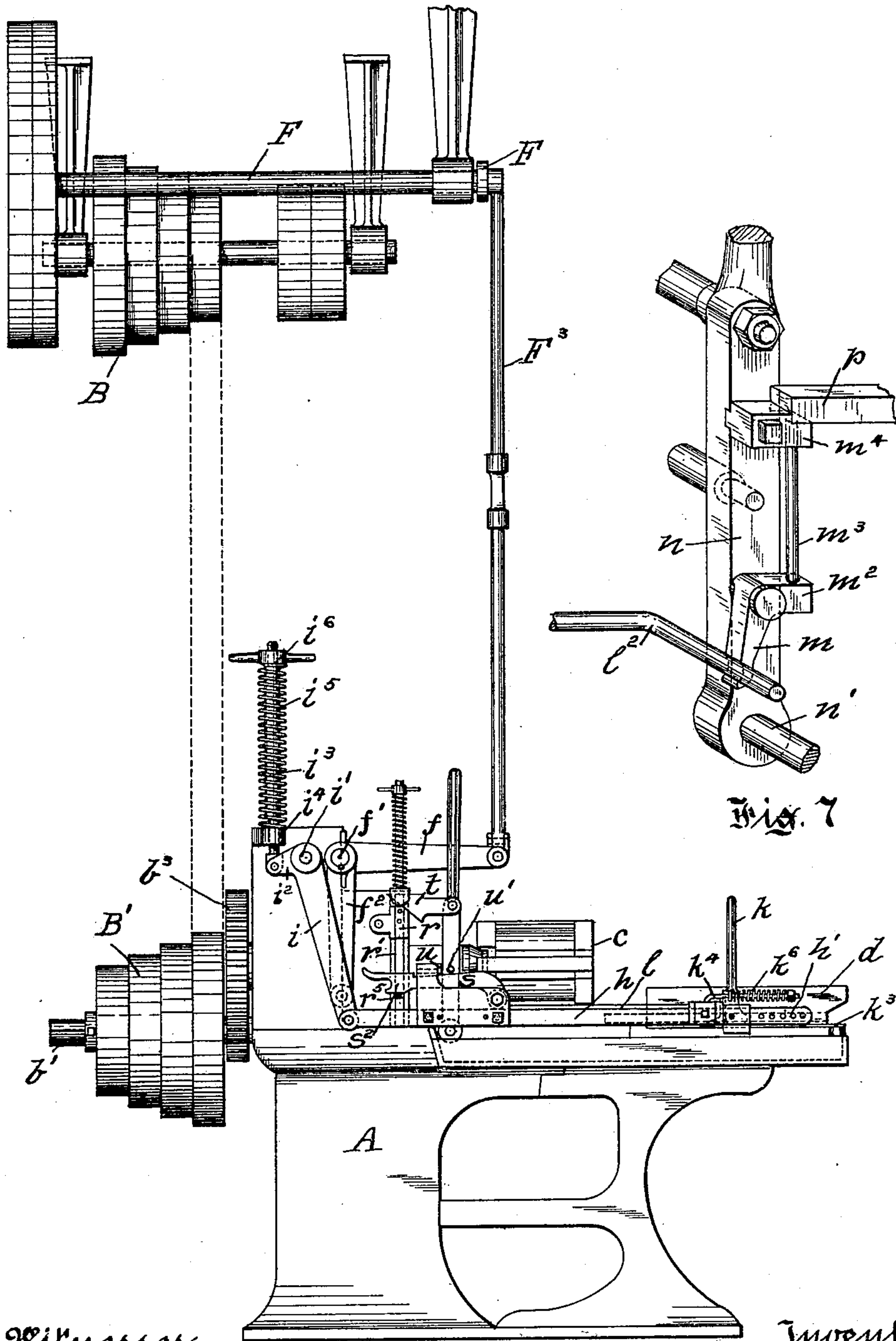
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5 Sheets—Sheet 2.



Witnesses  
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Fig. 2

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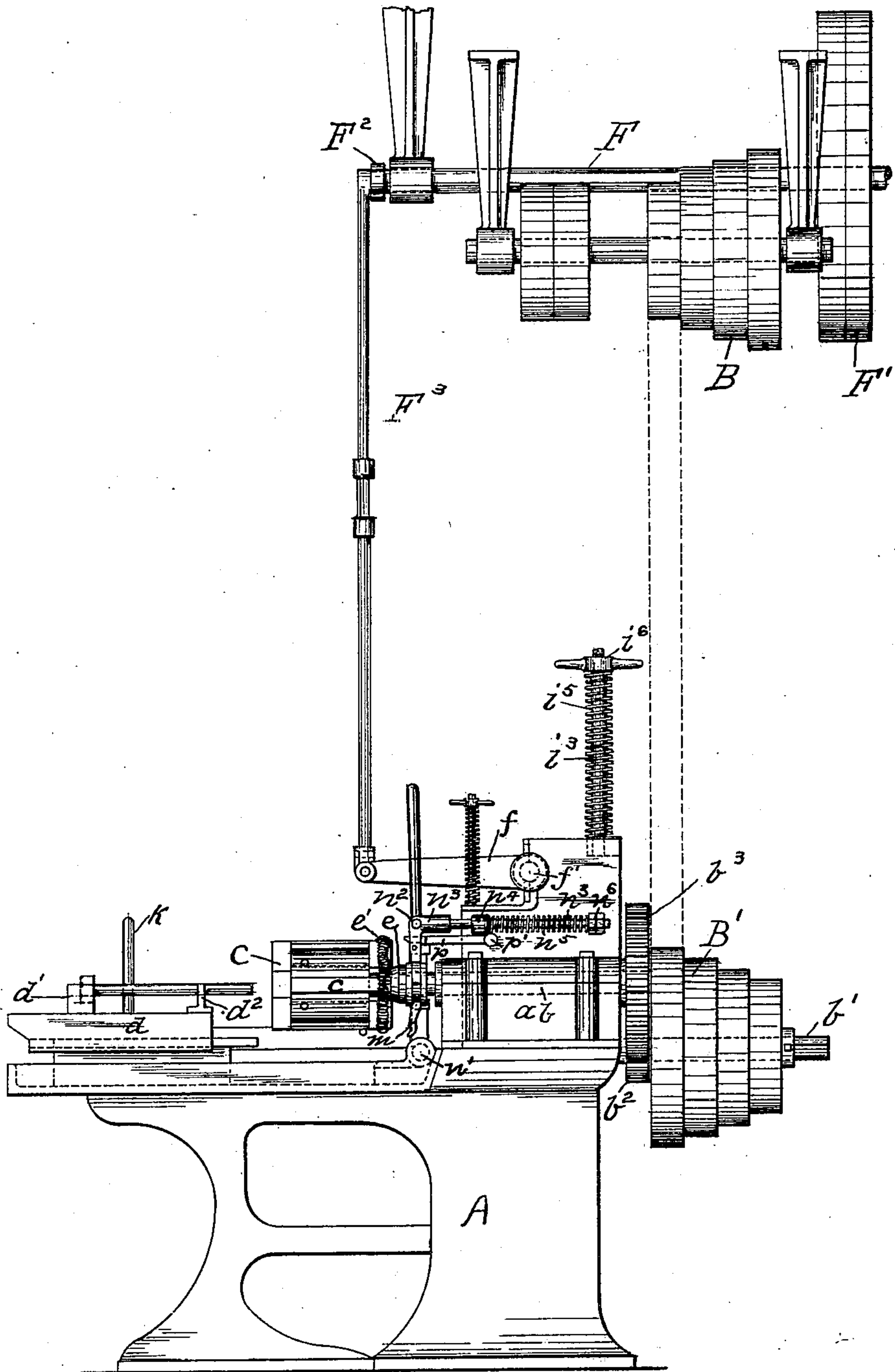
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5 Sheets—Sheet 3.



Witnesses

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Fig. 3

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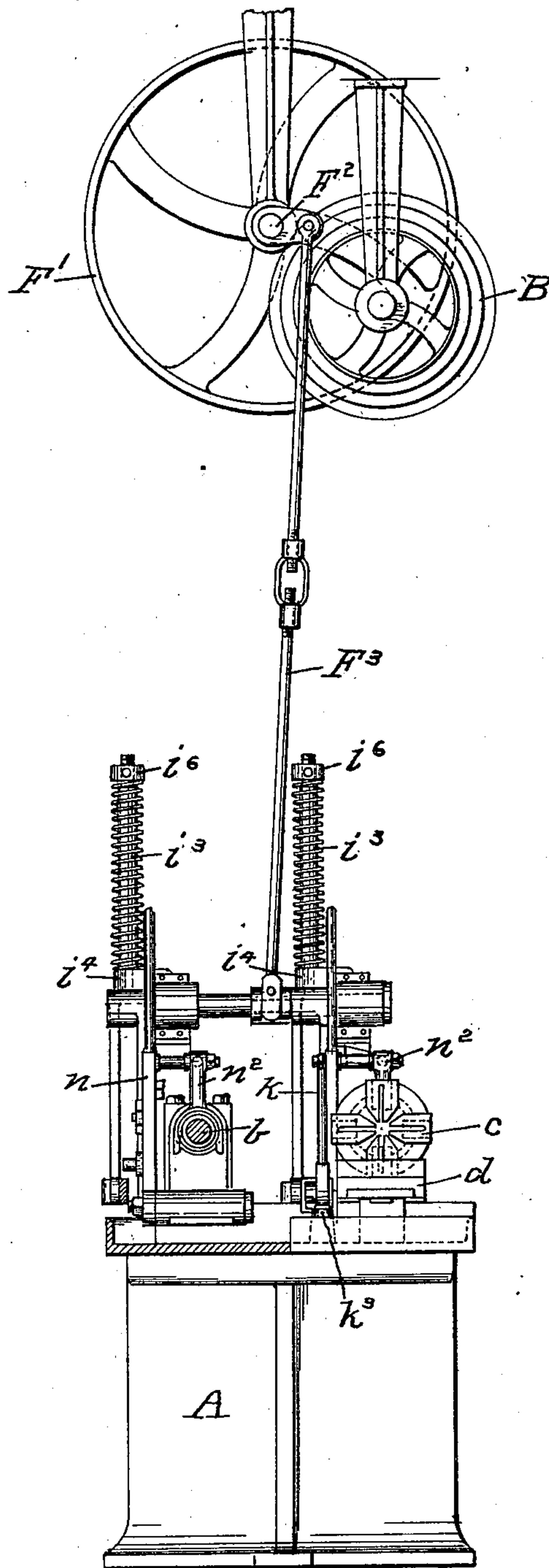


Fig. 4

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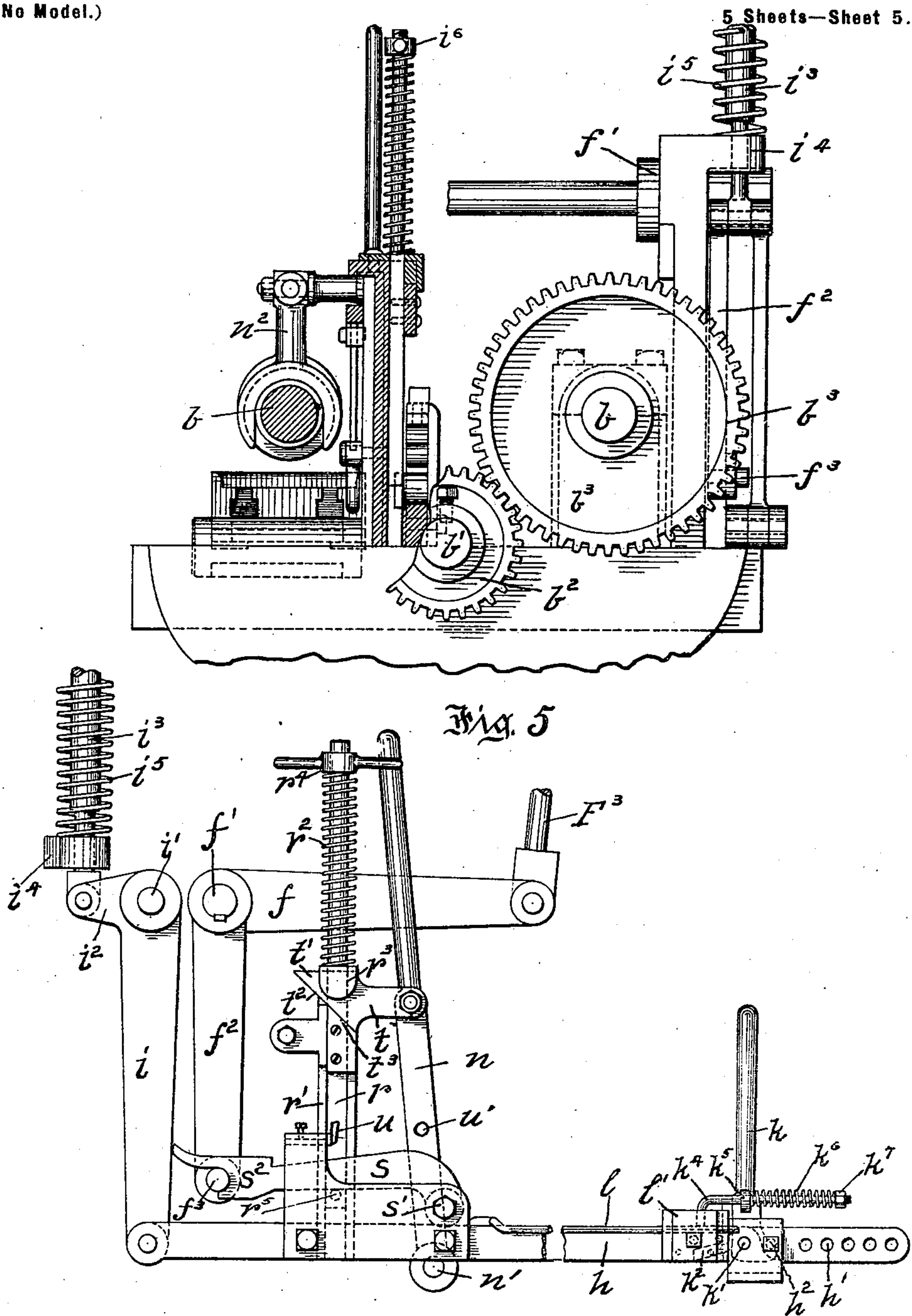
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(Application filed Aug. 14, 1899.)

(No Model.)

5 Sheets—Sheet 5.



Witnesses  
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Fig. 6

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# UNITED STATES PATENT OFFICE.

CHARLES LANZ, OF PITTSBURG, PENNSYLVANIA.

## BOLT-THREADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 673,559, dated May 7, 1901.

Application filed August 14, 1899. Serial No. 727,161. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES LANZ, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Bolt-Thread-  
ing Machines; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to machines for threading bolts, its object being to make the work automatic, overcoming much of the manual labor required in the ordinary bolt-machines, and so providing for the more rapid running of the machines and for increasing the output thereof. The ordinary machine for threading bolts contains a rotating head carrying the threading-dies, in front of which is a sliding carriage in which the bolt is placed, and it was required that the feeder after placing the bolt on the carriage would press forward the carriage with sufficient force to hold the bolt up to the threading-dies until they grasped the same, after which the dies would draw the bolt in with them as they rotated around the end thereof in the threading operation and would open automatically when the threading was completed; but it required the workman to withdraw the sliding carriage, take out the threaded bolt, insert another in the holder, and press forward the carriage and hold it until the dies would engage that bolt. This required time and made the work very laborious. By the present invention practically all these operations are overcome, the only necessity being for the workman to place the bolts in the carriage and remove them therefrom when the threading is completed.

The invention comprises certain improvements which will be hereinafter more particularly described, including spring mechanism for drawing forward the carriage to feed the bolt into the threading-dies and certain tripping mechanism which when withdrawing the cone which closes the threading-dies operates also through certain mechanism and a reciprocating pusher to push forward the carriage and lock it in its forward position, so that the workman is only required to with-

draw a bolt, feed another in its place, and through a lever trip the mechanism, so as to free the spring mechanism to draw the bolt forward into the threading-dies. The special points of invention desired to be covered will be more specifically set forth in the claims.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a top or plan view of the machine. Fig. 2 is a side view looking at it from one side. Fig. 3 is a side view looking at it from the other side. Fig. 4 is in part a front view and in part a sectional view showing the position of the mechanism, and Figs. 5 to 7 are details showing the operation of the particular mechanism involved.

Like letters indicate like parts in each of the figures.

The machine has the ordinary table or frame A, having bearings *a*, in which is mounted the shaft *b*, carrying the threading-dies *c*, which are of the ordinary construction and do not need any particular description. In front of said threading-dies is the sliding carriage *d*, which carries the bolt-holder *d'* and for long bolts has at the forward end a guide *d''*, the bolt resting in the holder *d'* and being supported in the guide *d''* centrally of the threading-dies, so that as said dies rotate continuously they can operate upon the front end of the bolt. The dies are held in levers *c'*, properly mounted on the shaft *b*, so as to be closed by the cone *e* sliding on the shaft *b*, the dies being opened by the spring *e'*, extending around the rear ends of the die-levers *c'* and holding them in contact with the cone *e* and opening up their forward ends when the cone is withdrawn.

The parts forming the driving mechanism are well known and need but little description. The machine is intended for the cutting of two bolts, being a double machine, as shown in the front view, Fig. 4, and indicated in the top view, Fig. 1, the power from the overhead pulleys B being carried by a belt to the pulleys B' on the shaft *b'*, which by pinion *b''* and gear-wheel *b'''* rotates the shaft *b* to drive



each threader. The apparatus is illustrated as having mounted above the machine a separate shaft, which carries a pulley  $F'$ , driven by a separate belt from the main power-shaft and having at its forward end the crank  $F^2$ , which engages with the reciprocating rod  $F^3$ , extending down to the body of the machine and connecting to the crank  $f$ , which is mounted in the bearing  $f'$  on the machine-body and has the depending pushing-arm  $f^2$ , carrying a lug or pin  $f^3$ , this arm being continuously reciprocated at rather a slow speed for the purposes hereinafter described. The reciprocating motion may be applied to the pusher in any suitable way. Mounted at one side of the machine and extending forward and connected to the carriage  $d$  is the strap  $h$ , the forward end of which may be connected to the carriage at any suitable position by means of a series of bolt-holes, as at  $h'$ , in its free end, through which the bolt  $h^2$  passes into the carriage, this strap  $h$  extending toward the rear of the machine and being pivotally connected to the crank-arm  $i$ , mounted on the machine-body at  $i'$  and having a short arm  $i^2$ , which connects to the rod  $i^3$ , passing through the bearing  $i^4$  on the machine-frame, the spring  $i^5$  fitting around the rod  $i^3$  and being confined between the bearing  $i^4$  and the nut  $i^6$ , screwing on the upper end of the rod  $i^3$ , so providing an adjustable spring connection, serving through the spring  $i^5$ , crank  $i$ , and strap  $h$  to draw the carriage  $d$  toward the threading-dies and feed the bolt to be threaded into the same, the spring  $i^5$  providing the necessary pressure to hold the bolt up to the dies until they bite upon the same and draw it in by their own action, and the spring also serving during this threading action, by the pressure applied to the bolt, to cause the same regular and even feeding of the same to the threading-dies and to relieve said dies from the strain of drawing in the bolt when it is connected to the bolt-carriage. To start the movement of the bolt-carriage after a bolt is inserted therein, the strap  $h$  also carries the spring tripping-lever  $k$ , which is mounted on the strap at  $k'$  and carries the pawl  $k^2$ , which can engage either with the machine-frame or the seat in a plate  $k^3$ , adjustably secured to the machine-frame. Mounted also on the strap  $h$  is the bent arm  $k^4$ , which passes through an eye  $k^5$  on the lever  $k$  and carries the spring  $k^6$ , which is compressed between said eye  $k^5$  and the nut  $k^7$ , and therefore serves to hold the pawl  $k^2$  in the seat or notch in the plate  $k^3$ , by which the strap  $h$  and carriage  $d$  are held in withdrawn position until the lever  $k$  is pulled back, withdrawing the lug  $k^2$  from the notch in the plate  $k^3$ , when the spring mechanism pulling on the bar  $h$  will advance the carriage to bring the bolt into the die. This same strap  $h$  carries the gage-bar  $l$ , which is secured in the block  $l'$  and can be adjusted according to the different lengths of thread or of bolt to be operated on. The gage-bar  $l$

has its forward end bent, as at  $l^2$ , and is so adjusted that when the desired portion of the bolt has been threaded it will strike against the lower end of the tripping-dog  $m$ , which is carried upon the main cone-lever  $n$ . This cone-lever  $n$  is mounted in the main frame at  $n'$  and carries the cone-arm  $n^2$ , which engages with the collar of the cone and so imparts forward or backward movement to the same, the cone-lever also having the elbow-arm  $n^3$ , passing through a lug  $n^4$  on the machine-frame and carrying a spring  $n^5$ , confined by the nut  $n^6$ , so that when the cone-lever is tripped and released, as is to be described, it will draw back the cone and open the threading-dies. In order to trip and release the cone-lever, as shown in the enlarged view, Fig. 7, the gage-arm  $l$  contacts with the tripping-dog  $m$ , mounted on the cone-lever and having the rearwardly-extending lug  $m^2$  provided with a seat for the lower end of the rod  $m^3$ , the upper end of said rod passing through the lug  $m^4$ , so that when said dog is pushed back the rod  $m^3$  will rise through said lug and in so doing will strike against and lift the dog  $p$ , which is pivoted to the machine-frame at  $p'$ , and engages with the cone-lever to hold it in its advanced position, closing the threading-dies. It will be evident that by means of such mechanism when the gage  $l$  strikes the dog  $m$  and through the bar  $m^3$  raises the pivoted dog  $p$  the spring  $n^5$  (drawing on the cone-lever) draws out the cone, so opening the dies, leaving, however, the carriage in its advanced position, with the bolt within the open threading-dies.

I will now describe the mechanism for withdrawing the carriage, so that the bolt may be lifted therefrom and another fed to the machine.

Formed on the machine-frame is a vertical guideway  $r'$ , in which is mounted a sliding bar  $r$ , the upper end of this sliding bar above the guideway being formed cylindrical and carrying the spring  $r^2$ , which presses against a lug  $r^3$ , extending out from the machine-frame, the spring  $r^2$  being confined between said lug  $r^3$  and the hand-nut  $r^4$ . This spring naturally holds the bar  $r$  in raised position, as shown in Fig. 2, and said bar has the pin  $r^5$  at its lower end, on which rests the arm  $s$ , which is pivoted at its forward end to the bearing  $s$ , carried on the strap  $h$ , and extends back through said bearing over the pin  $r^5$ , being supported by said pin and normally held in raised position, as shown in Fig. 2, so that as the pushing-lever  $f$  is reciprocated, as above described, this pin  $f^3$  on its depending arm  $f^2$  will not contact with the arm  $s$ , but will swing under the same until the arm  $s$  is lowered far enough to bring the forked end  $s^2$  of the arm  $s$  into line with the pin  $f^3$  of the elbow-lever  $f$ , when (as said elbow-lever is continuously reciprocated through the mechanism above described) the elbow-lever will push forward the arm  $s$ , and with it the strap



5 *h*, against the pressure of the spring mechanism operating through the elbow-lever *i*, and will thereby force both the strap *h* and the bolt-carriage *d* forward until the pawl *k*<sup>2</sup> en-  
 gages with the seat or notch in the plate *k*<sup>3</sup> and holds the carriage in forward position. As shown in Figs. 2 and 6, the cone-lever *n* carries thereon the wedge *t*, pivoted on said lever and extending back under the lug *r*<sup>3</sup> of  
 10 the machine-frame. The wedge *t* has the horizontal upper edge *t*<sup>1</sup>, contacting with the lug *r*<sup>3</sup>, and the inclined lower edge *t*<sup>2</sup>, contacting with the inclined plate *t*<sup>3</sup> upon the sliding bar *r*. When therefore the gage *l* oper-  
 15 ates through the tripping-dog *m* and bar *m*<sup>3</sup> to raise the pivoted dog *p*, leaving the cone-lever free to be withdrawn by the spring *n*<sup>5</sup>, said spring draws back the wedge-piece *t*, forcing it under the lug *r*<sup>3</sup>, and so forcing  
 20 downwardly the sliding bar *r*, thus permitting the forked arm *s*, resting on the pin *r*<sup>5</sup> of said sliding bar, to be lowered into the course of the reciprocating elbow-lever *f*, so said lever will push forward the forked arm, and  
 25 with it the main strap or body *t* and the bolt-carriage, as above described. To force the cone of the threading-dies forward and close such threading-dies after the threaded bolt has been withdrawn, I provide the bearing  
 30 on the strap *h* with the adjustable lug *u*, which strikes upon the pin *u*<sup>1</sup> on the cone-lever *n* and forces said lever forward against the pressure of the spring *n*<sup>5</sup>, so forcing the cone *c* in between the sections of the thread-  
 35 ing-die and closing the same, the cone-lever being forced forward by said lug until the pivoted dog *p* on the machine-frame engages with said cone-lever and holds it in its advanced position, so bringing all the parts  
 40 back into position for the next threading operation.

I will now recapitulate the operation of threading bolts, so that it may be clearly understood. The operator simply places the  
 45 bolt in the bolt-holder *d*<sup>1</sup> of the carriage *d* and trips the lever *k*, when the spring *i*<sup>5</sup>, operating upon the crank-arm *i* and through the strap *h*, draws the carriage forward and exerts the necessary pressure to feed the bolt  
 50 into the dies. The revolving dies then cut the thread upon the bolt, this operation continuing until the gage-bar *l* strikes the tripping-dog *m* and raises the pivoted dog *t* and frees the cone-lever *n*, when the spring *n*<sup>5</sup>  
 55 draws back the cone-lever, so drawing back the cone and opening the threading-dies. At the same time the wedge *t*, carried by the cone-lever, passes under the lug *r*<sup>3</sup> and depresses the sliding bar *r*, so lowering the  
 60 forked arm *s* in position to engage with the pushing-lever *f*, which pushes forward said forked arm, and with it pushes forward the strap *h* against the force of the spring *i*<sup>5</sup>, so retracting the bolt-carriage *d* and drawing  
 65 the bolt from the threading-dies, the strap and carriage being retracted until the trip-

ping-lever *k* engages with the seat in the plate *k*<sup>3</sup> of or attached to the machine-frame, holding the bolt-carriage in its retracted position. In this retracting movement of the  
 70 strap *h* its lug *u*, carried on the bearing *s*<sup>1</sup>, strikes against the pin *u*<sup>1</sup> on the cone-lever and forces the cone-lever and cone forward against the pressure of the spring *n*<sup>5</sup> until the cone-lever is engaged by the tripping-dog *p*  
 75 and the parts are brought back into position. The manual work in connection with the machine is therefore reduced to the placing of the bolt in the bolt-holder, the tripping of the lever *k*, and the removal of the threaded bolt,  
 80 and the ordinary operator can attend to twice the number of threading-machines than has heretofore been found practicable where it was necessary for him to manually operate  
 85 the bolt carriage in feeding it to and with- drawing it from the threading-dies.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In bolt-threading apparatus, the combination of threading-dies, a sliding bolt-carriage, spring mechanism for advancing the  
 90 same, continuously-reciprocating pushing mechanism, and means acted on by said pushing mechanism for retracting the carriage, substantially as set forth. 95

2. In bolt-threading apparatus, the combination of threading-dies, a sliding bolt-carriage, spring mechanism for advancing the  
 100 same and continuously-reciprocating pushing mechanism for retracting the carriage, substantially as set forth. 100

3. In bolt-threading apparatus, the combination of threading-dies, a sliding bolt-carriage, spring mechanism for advancing the  
 105 same, continuously-reciprocating pushing mechanism and a swinging arm adapted to be brought into line with such pushing mechanism and thereby retract the carriage, and tripping mechanism carried by the carriage  
 110 to cause the movement of said swinging arm, substantially as set forth. 110

4. In bolt-threading apparatus, the combination of threading-dies, and a cone for opening and closing the same, a sliding carriage, spring mechanism for advancing the same,  
 115 and continuously-reciprocating pushing mechanism for retracting the carriage and advancing the cone to close the dies. 115

5. In bolt-threading apparatus, the combination of threading-dies, a bolt-carriage, mechanism for advancing the same carrying  
 120 a pivoted arm, and continuously-reciprocating pushing mechanism, and means for lowering said arm into line with the pushing mechanism. 125

6. A bolt-threading mechanism having threading-dies and a cone-operating lever in combination with withdrawing mechanism  
 130 for said lever, a pivoted dog engaging with the lever and holding the threading-dies closed, a bolt-carriage and a gage thereon engaging with tripping mechanism for releasing



the cone-lever, a backwardly-extending retracting-arm connected to the cone-lever and a spring engaging therewith to retract the cone-lever.

5 7. A bolt-threading mechanism having threading-dies and a cone-operating lever in combination with withdrawing mechanism for said lever, a pivoted dog engaging with the lever and holding the threading-dies  
10 closed, a bolt-carriage and a gage thereon engaging with tripping mechanism for releasing the cone-lever, a backwardly-extending retracting-arm connected to the cone-lever and a spring engaging therewith to retract the  
15 cone-lever, the backwardly-extending arm passing through a lug in the machine-frame and carrying the spring confined between said lug and a nut at the end of the arm.

20 8. A bolt-threading mechanism having threading-dies and a cone-operating lever in combination with withdrawing mechanism for said lever, a pivoted dog engaging with the lever and holding the threading-dies closed, a bolt-carriage and a gage thereon en-  
25 gaging with tripping mechanism for releasing the cone-lever, a tripping-dog carried by the cone-lever, a stop on the cone-lever, a rod operated thereby and passing through the stop to raise the pivoted dog and free the cone-  
30 lever.

9. In bolt-threading apparatus, the combination of threading-dies, a sliding bolt-carriage having a strap extending back there-  
35 from and connected to spring mechanism for advancing the carriage, an arm pivoted to said strap, a vertically-sliding bar supporting said arm, and continuously-reciprocating pushing mechanism and means for lowering  
40 said bar and thereby bringing the arm in line with the pushing mechanism.

10. In bolt-threading apparatus, the combination of threading-dies, a sliding bolt-carriage having a strap extending back there-  
45 from and connected to spring mechanism for advancing the carriage, an arm pivoted to said strap, a vertically-sliding bar supporting said arm, and continuously-reciprocating pushing mechanism, and a wedge engaging  
50 with and depressing said bar so as to bring the forked arm in line with the pushing mechanism.

11. In bolt-threading apparatus, the combination of threading-dies, a sliding bolt-carriage having a strap extending back there-  
55 from and connected to spring mechanism for advancing the carriage, an arm pivoted to said strap, a vertically-sliding bar supporting said arm, and continuously-reciprocating pushing mechanism and means for lowering  
60 said bar and thereby bringing the arm in line with the pushing mechanism, and a cone-operated lever carrying a wedge engaging with and depressing said bar so as to bring the  
65 forked arm in line with the pushing mechanism.

12. In bolt-threading apparatus, the combination of threading-dies, a sliding bolt-carriage having a strap extending back there-  
from and connected to spring mechanism for advancing the carriage, an arm pivoted to  
70 said strap, a vertically-sliding bar supporting said arm, and continuously-reciprocating pushing mechanism and means for lowering said bar and thereby bringing the arm in line  
75 with the pushing mechanism, and a cone-operated lever carrying a wedge engaging with and depressing said bar so as to bring the arm in line with the pushing mechanism, and mechanism for tripping the cone-lever and  
80 drawing it back.

13. In a bolt-threading apparatus, a continuously-reciprocating pushing mechanism in combination with a forked arm, the sliding  
bar  $r$  passing through the lug  $r^s$  on the machine-frame and carrying a spring above the  
85 same, and having the lug  $r^s$  supporting the forked arm and the wedge  $t'$  engaging with said lug and adapted to depress the sliding bar.

14. In bolt-threading apparatus, the combination of threading-dies, a cone, cone-oper-  
90 ating lever having a pin thereon, a bolt-carriage having a strap connected to advancing mechanism and carrying a lug and pushing mechanism adapted to retract said strap and  
95 thereby through said lug and pin force the cone into the threading-dies and close the same.

15. In bolt-threading apparatus, the combination of threading-dies, a cone, cone-oper-  
100 ating lever having a pin thereon, a bolt-carriage having a strap connected to advancing mechanism and carrying a lug and pushing mechanism adapted to retract said strap and  
105 thereby through said lug and pin force the cone into the threading-dies and close the same, and a pivoted dog engaging with the cone-lever to hold the cone in closed position.

16. In bolt-threading apparatus, the combination of threading-dies, a sliding carriage  
110 connected to advancing mechanism, and a pushing-lever mounted on the machine-frame and adapted to engage with and retract the carriage, and a continuously-operating pitman connected to the pushing-lever to im-  
115 part continuous reciprocating motion thereto.

17. In bolt-threading apparatus, the combination of threading-dies, a sliding carriage  
connected to advancing mechanism, and a pushing-lever mounted on the machine-frame  
120 and adapted to engage with and retract the carriage, and a pitman connected to the pushing-lever to impart continuous reciprocating motion thereto, and a crank connected to said  
125 pitman and turned by mechanism independent of the machine, substantially as set forth.

18. In bolt-threading apparatus, the combination of threading-dies, a sliding carriage,  
carriage-advancing mechanism connected  
thereto, a pusher for retracting the carriage  
130



and a spring-lever on the carriage for holding it in withdrawn position.

19. In bolt-threading apparatus, the combination of threading-dies, a sliding carriage, carriage - advancing mechanism connected thereto, a pusher for retracting the carriage and a spring-lever on the carriage for holding it in withdrawn position, and an adjust-

able seat on the machine-frame with which said spring-lever engages.

In testimony whereof I, the said CHARLES LANZ, have hereunto set my hand.

CHARLES LANZ.

Witnesses:

GRACE C. RAYMOND,  
ROBERT C. TOTTEN.

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