

(No Model.)

4 Sheets—Sheet 1.

C. F. WICKWIRE.
LOOM FOR WEAVING WIRE.

No. 409,813.

Patented Aug. 27, 1889.

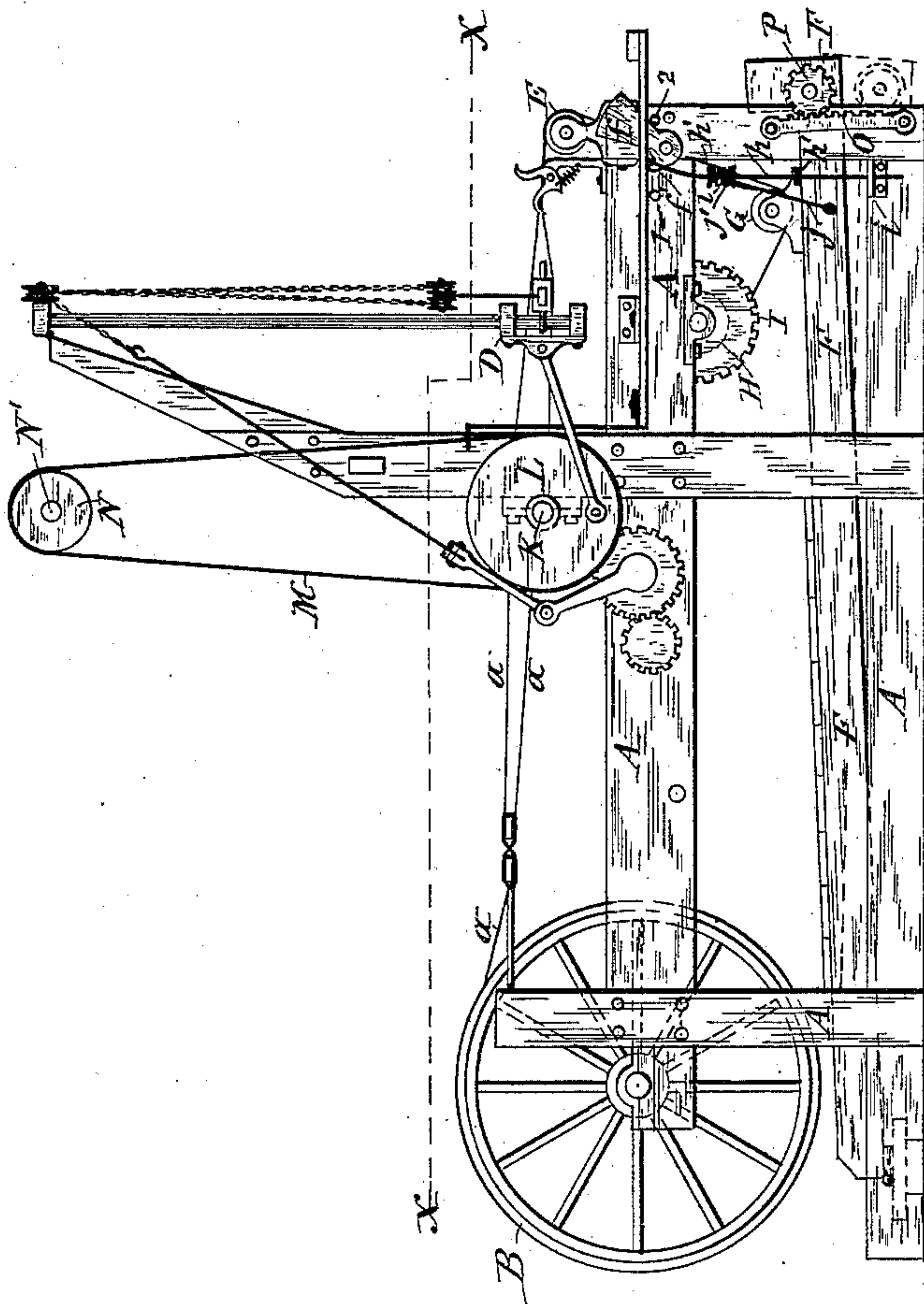


Fig. 1

WITNESSES:

John W. Suggett
W. C. Crombie

INVENTOR

Charles F. Wickwire
BY Samuel S. Benedict

ATTORNEYS

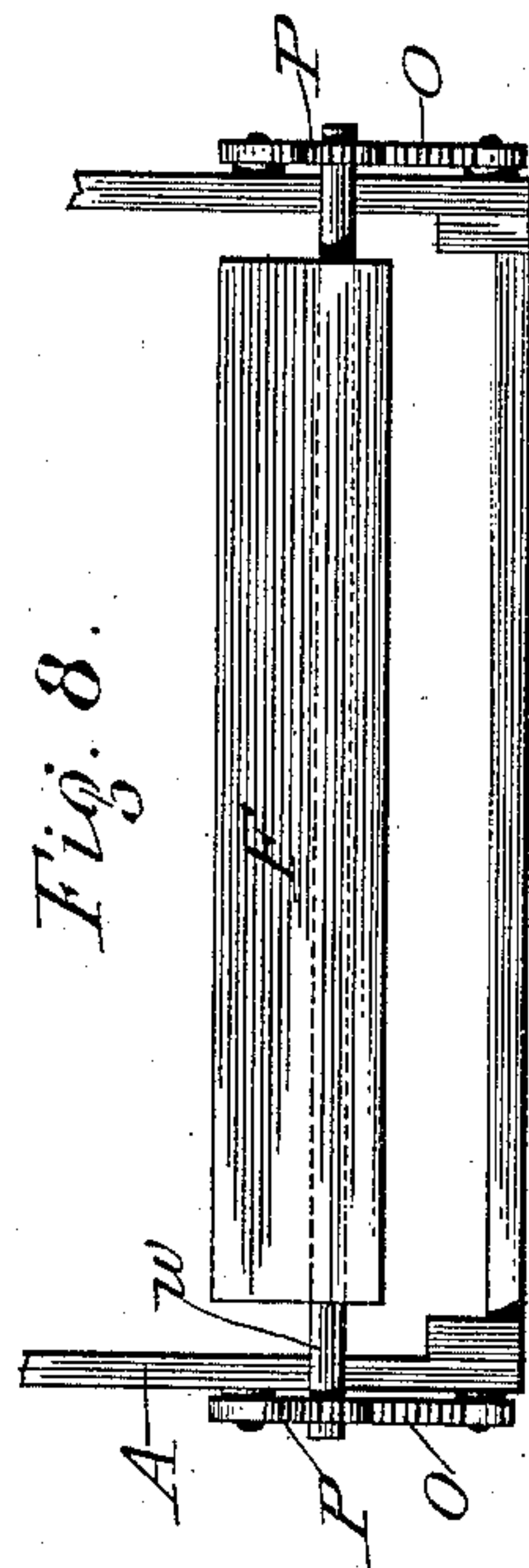
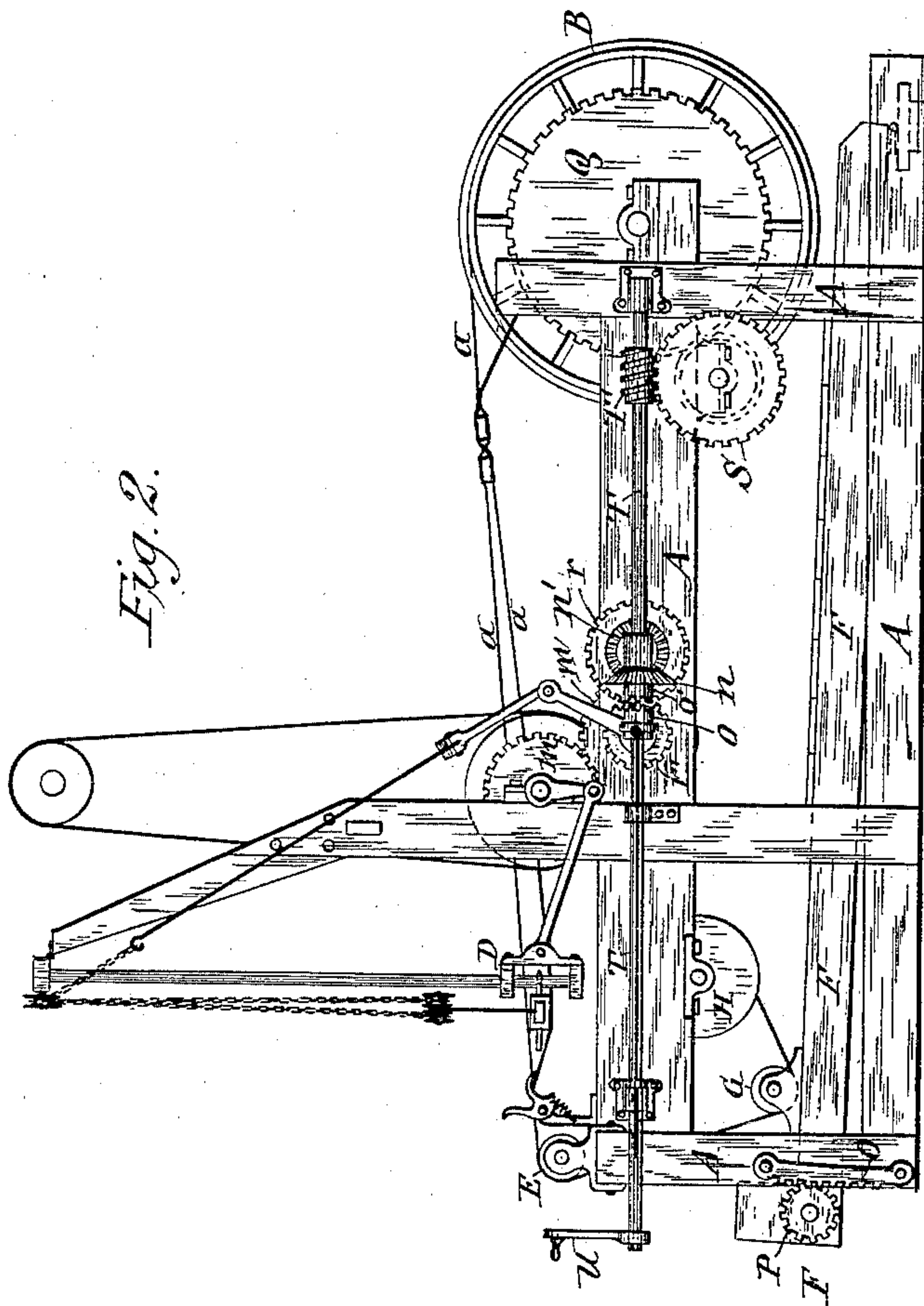
(No Model.)

4 Sheets—Sheet 2.

C. F. WICKWIRE.
LOOM FOR WEAVING WIRE.

No. 409,813.

Patented Aug. 27, 1889.



WITNESSES:

John W. Suggett,
W. C. Bromie

INVENTOR

Chester F. Wickwire

BY

Duell & Benedict

ATTORNEYS,

(No Model.)

4 Sheets—Sheet 3.

C. F. WICKWIRE.
LOOM FOR WEAVING WIRE.

No. 409,813.

Patented Aug. 27, 1889.

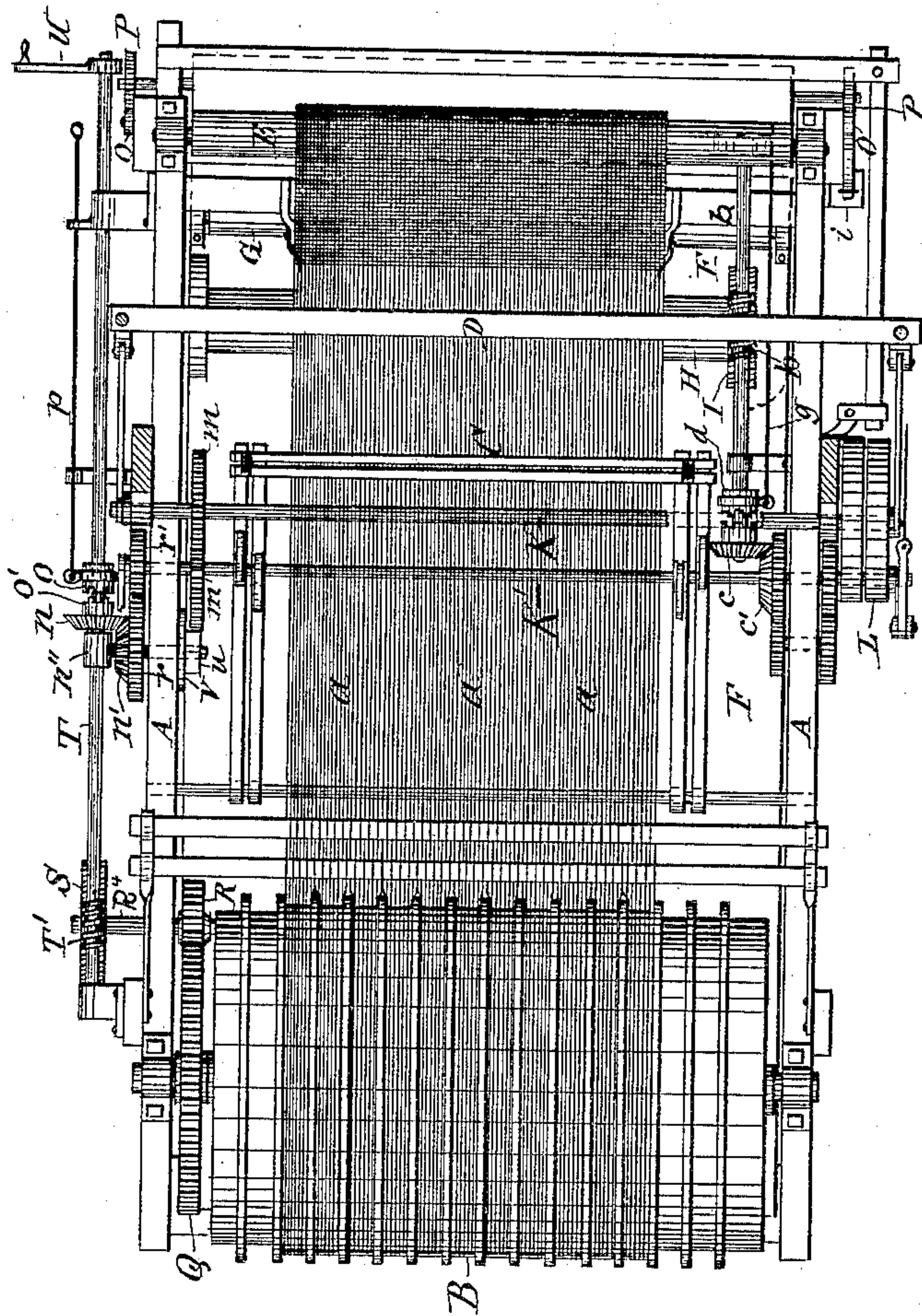


Fig. 3

WITNESSES:

John W. Suggett,
H. C. Brombie

INVENTOR

INVENTOR
Charles F. Wickwire
BY
Quill & Benedict
ATTORNEYS

ATTORNEYS

(No Model.)

4 Sheets—Sheet 4.

C. F. WICKWIRE.
LOOM FOR WEAVING WIRE.

No. 409,813.

Patented Aug. 27, 1889.

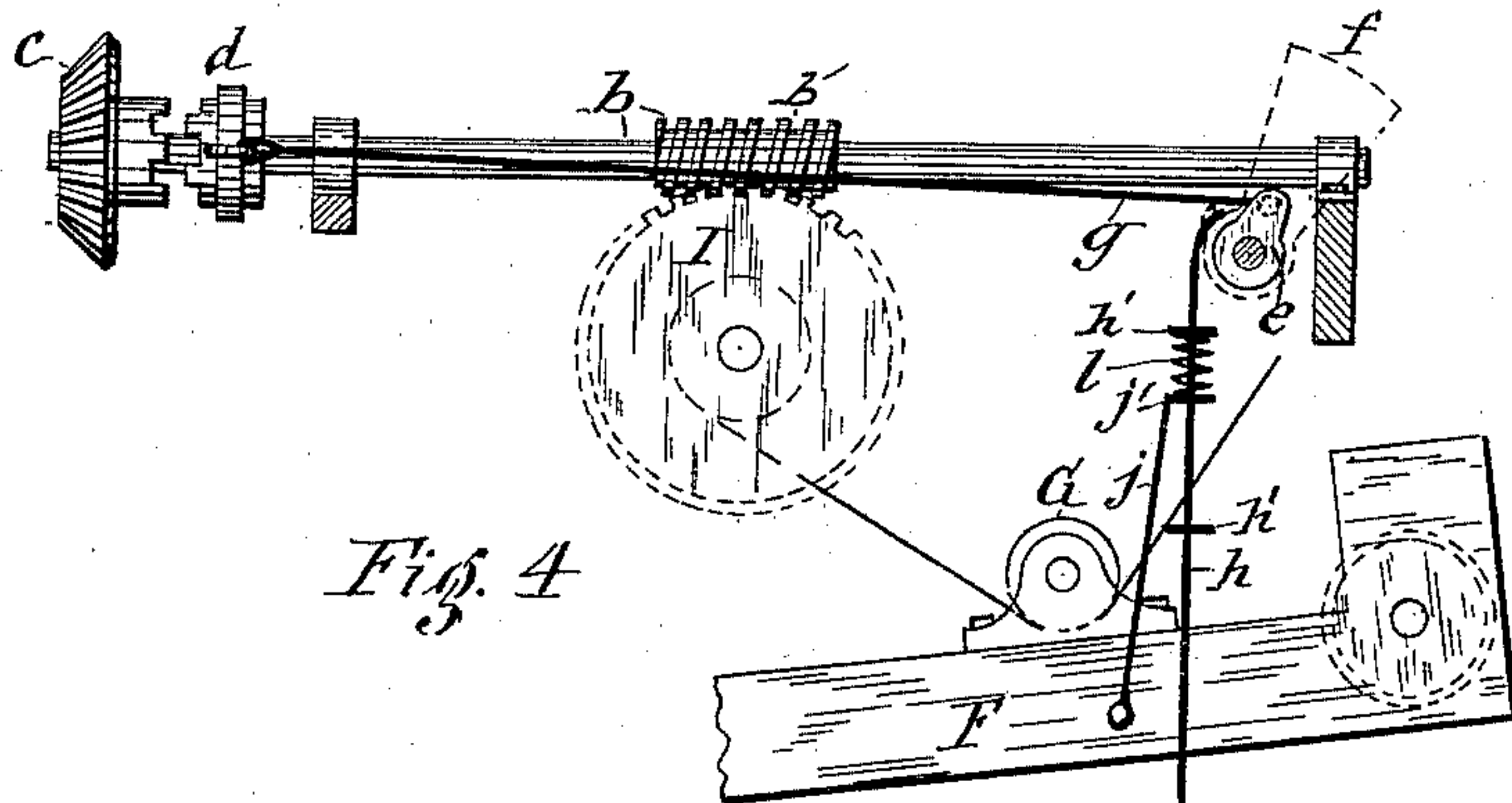


Fig. 4

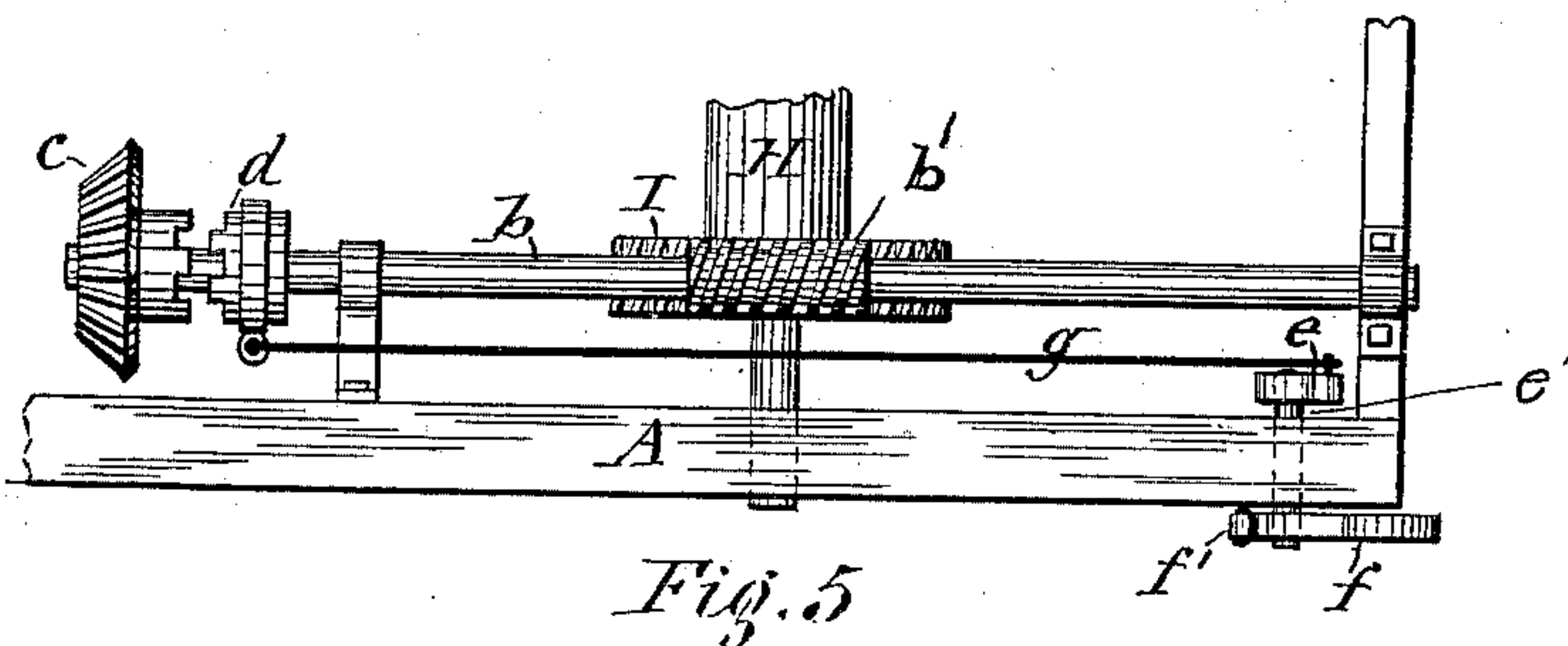


Fig. 5

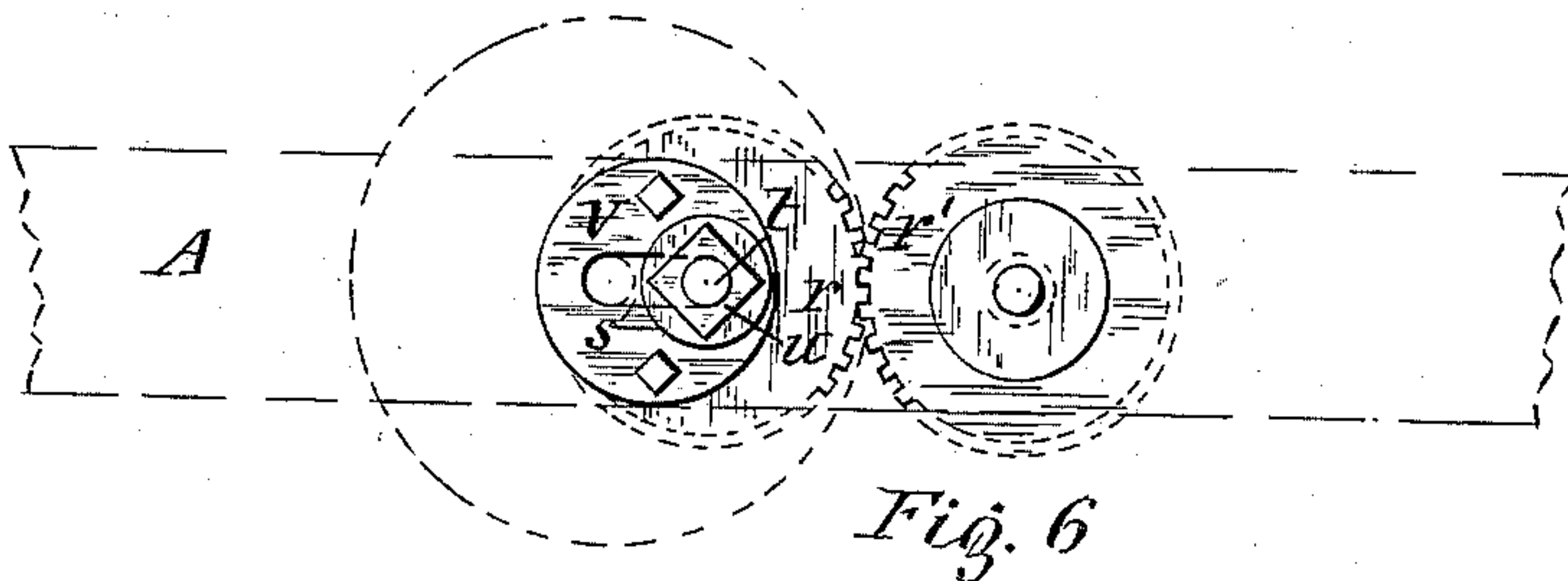


Fig. 6

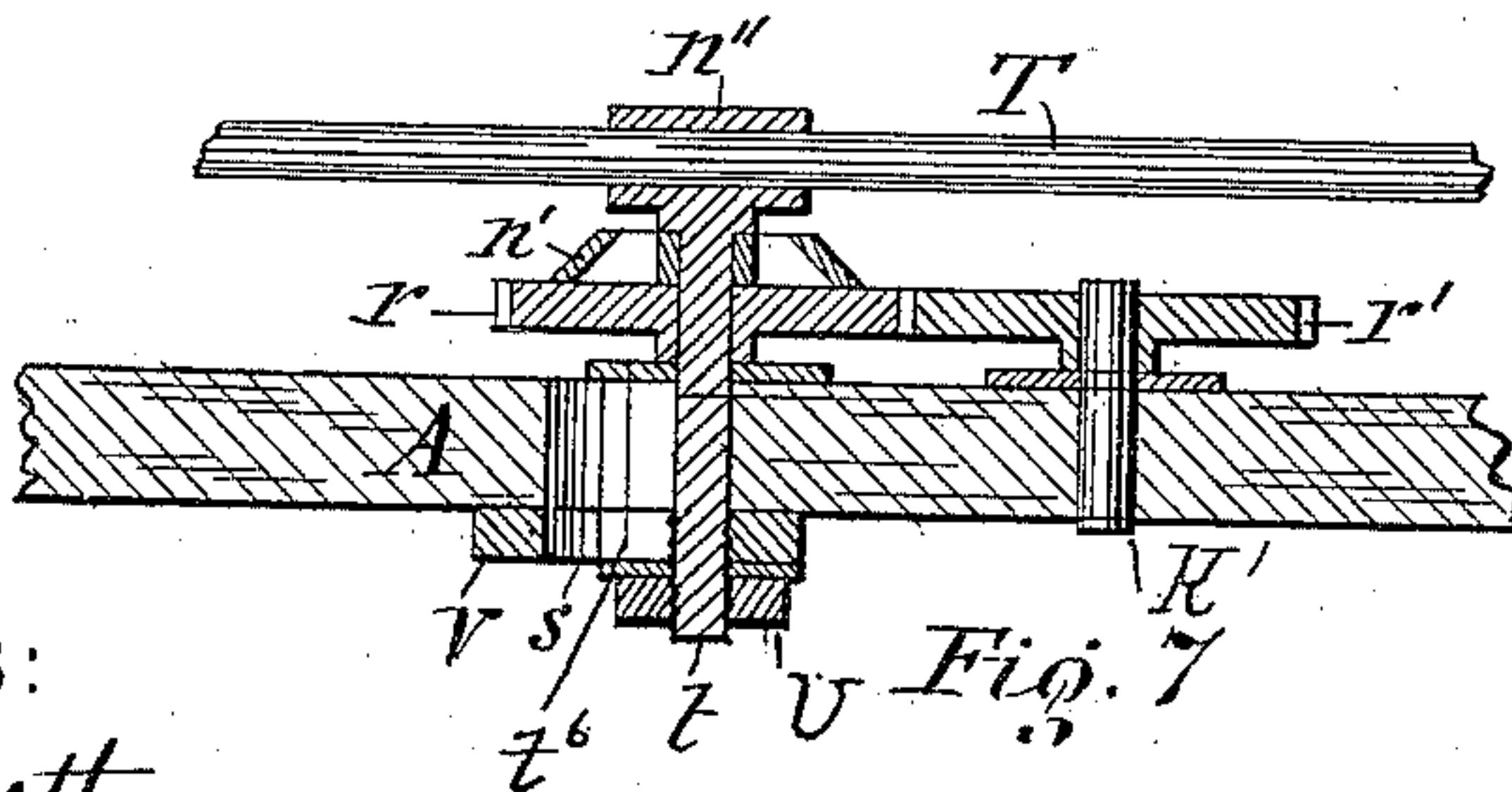


Fig. 7

WITNESSES:

John W. Suggett
W. C. Brown

INVENTOR

Chester F. Wickwire

BY

Duell & Bender

ATTORNEYS

UNITED STATES PATENT OFFICE.

CHESTER F. WICKWIRE, OF CORTLAND, NEW YORK.

LOOM FOR WEAVING WIRE.

SPECIFICATION forming part of Letters Patent No. 409,813, dated August 27, 1889.

Application filed February 11, 1887. Serial No. 227,273. (No model.)

To all whom it may concern:

Be it known that I, CHESTER F. WICKWIRE, a citizen of the United States, residing at Cortland, in the county of Cortland and State of New York, have invented certain new and useful Improvements in Looms for Weaving Wire, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention consists, first, in novel take-up mechanism connected to a wire-cloth loom for the purpose of automatically maintaining the warp at a uniform tension and for winding the cloth tightly and uniformly upon a roll, and, secondly, in novel devices for regulating the motion of the warp-feeding cylinder of the loom, all as hereinafter more fully described and specifically set forth in the claims.

20 In the accompanying drawings, Figure 1 is a side elevation of a wire-cloth loom. Fig. 2 is an elevation of the opposite side of said loom, showing the automatic let-off mechanism by which the motion of the warp-feeding cylinder is controlled. Fig. 3 is a plan view taken below the line $x x$, Fig. 1. Figs. 4 and 5 are enlarged detail side and plan views of the mechanism for automatically effecting the take-up of the cloth in the operation of weaving. Figs. 6 and 7 are enlarged detached side and sectional views showing mainly the interchangeable pinions by which to regulate the motion of the warp-feeding cylinder; and Fig. 8 is a front view of the gravitating frame of the take-up mechanism.

Similar letters of reference indicate corresponding parts.

40 A represents the frame of the loom, which frame may be of any suitable and well-known form. In boxes secured to the two sides of said frame, at the rear end thereof, is journaled the warp-feeding cylinder B, on which are wound the wires a constituting the warp, said warp passing through the usual heddles of the harness C, thence through the lay or batten D, in front of which is carried the usual shuttle-operating mechanism (not shown) which introduces the weft between the warp. The cloth thus woven passes over 50 a horizontal roller E, extended across the top

of the front portion of the frame A and journaled at opposite ends in suitable bearings or boxes secured to said frame.

At the base of the frame A, between the two sides thereof, is a frame F, which is 55 hinged at one end to the base of the rear portion of the frame A, the front end of the frame F extending to the front of the frame A and being movable vertically, and suspended thereat by the cloth passing under a bearing secured to the frame F. For said bearing I prefer to employ a roller G, extended across the top of the frame F parallel with the roller E and journaled in boxes secured to said frame. 65

H is the roller on which the cloth is to be wound. Said roller is arranged back of the roller E and parallel therewith and journaled in boxes secured to the sides of the frame A. The cloth passes from the roller E around the under side of the roller G, and thence around the roller H, upon which it is wound into a roll of suitable size for handling and transporting it. This taking up the cloth and winding it on the roller H, I accomplish automatically and with a uniform tension on the cloth by the following novel mechanisms, which, in conjunction with the gravitating frame F, heretofore referred to, constitute part of my present invention. On one end of 80 the roller H is secured a worm gear-wheel I, in which meshes a worm-shaft b , which is arranged at right angles to the roller H and journaled in suitable bearings secured to the frame A. On the rear end of the shaft b is 85 loosely mounted a bevel-pinion c , which is provided with a clutch-face on its hub, and in front of this clutch-face is a clutch member d , sliding on the shaft b and connected therewith by the usual spline on the shaft 90 extending through a groove in the eye of said clutch member. On the front portion of one side of the frame A is pivoted a short shaft e' , on one end of which is fastened a small crank or eccentric e , which is connected with 95 the clutch member d by a rod g . On the opposite end of the aforesaid shaft e' is firmly secured a weighted arm f , from which projects a lug f' , to which is firmly secured a pendent rod h , which passes through a guide 100

i on the frame A. To the side of the front end portion of the frame F is attached a rod *j*, the free end of which is provided with an eye *j'*, which loosely embraces the rod *h* between two collars *h' h'*, affixed to the latter. These collars are arranged such a distance apart as to allow the frame F free vertical movement without disturbing the rod *h* until said frame approaches its extreme lowered and raised positions, at which period the eye *j'* of the rod *j* collides with one of said collars, and either pushes the rod *h* up or draws it down and thereby tilts the weighted arm *f*, and this arm turns with it the crank or eccentric *e*, which by means of the rod *g* shifts the clutch member *d*, so as to throw it in or out of engagement with the clutch-face of the pinion *c*, hereinbefore described. A spring *l* is interposed between the eye *j'* and upper collar *h'*, as best seen in Fig. 4 of the drawings, to prevent undue strain of the rods *h j* and their connections during the upward thrust of the rod *j*.

K is the main driving-shaft of the loom, said shaft being extended across the loom and journaled in suitable boxes secured to the sides of the frame A. By means of a pulley L, secured to the shaft K, and a driving-belt M, extended from said pulley around a pulley N on a line-shaft N', the aforesaid driving-shaft receives its motion. Parallel with the driving-shaft is a counter-shaft K', mounted on the frame A and partaking motion from the driving-shaft by gears *m m* on the respective shafts meshing with each other, and on said counter-shaft is fastened a bevel-pinion *c'*, which meshes in the pinion *c*, hereinbefore referred to. The clutch member *d* is thrown in engagement with the pinion *c* by the crank or eccentric *e*, when the latter is thrown toward the said pinion by the weighted arm *f*, which is swung in said direction by the rod *j* drawing down the rod *h* as the front end of the frame F approaches its extreme depressed position, as indicated by dotted lines in Fig. 1 of the drawings. By the engagement of the aforesaid clutch member with the pinion *c* the worm-shaft *g* receives rotary motion, which is transmitted to the cloth-winding roller H by means of the gear I engaging the worm of the shaft *b*. The roller H is thereby turned in a direction to cause it to wind upon it the wire-cloth, and its motion is somewhat faster than the feed of the loom, and consequently the forward end of the hinged frame F is lifted by the draft on the cloth passing around the under side of the roller G, mounted on said frame, as hereinbefore described. As the frame F approaches its extreme elevated position, the eye *j'* of the rod *j* collides with the upper collar *h'* of the rod *h*, and in pushing the latter rod upward it throws the free end of the weighted arm *f* forward. The crank or eccentric *e*, being forced to turn in the same direction with the weighted arm, draws the clutch member *d* out

of engagement with the clutch-face of the pinion *c* by the medium of the rod *g*, and consequently the motion of the worm-shaft *b* and winding-roller H is stopped. The slack of the cloth in process of weaving is then taken up by the descent of the roller G, carried on the gravitating frame F, which is weighted to produce the requisite tension on the cloth. As the frame F arrives at its extreme depressed position, the eye *j'* of the rod *j* encounters the lower shoulder *h'* of the rod *h* and draws down the said rod, and by doing this it tilts the weighted arm *f* rearward, and thus causes the crank or eccentric *e* to throw the clutch member *d* into engagement with the clutch-face of the pinion *c*. This worm-shaft *b* and winding-roller H, being thereby again set in motion, cause the said roller to wind up the cloth and lift the frame F in the manner before stated.

At opposite sides of the arm *f* are stops 1 2, secured to the frame A in such positions as to arrest the said arm from moving beyond the required distance.

In order to compel the two sides of the frame F to move in unison with each other, I extend transversely through the front end of the frame F a horizontal shaft *w*, journaled to rotate thereon, and to the extremities of said shaft I rigidly secure pinions P P, which mesh with vertical segmental racks O O, attached to the frame A, as best seen in Fig. 8 of the drawings. By placing more or less weight on the frame F the tension of the cloth can be increased or diminished, as may be required for the different grades of cloth.

The feed or so-called "let-off" motion of the loom—i. e., the unwinding of the warp from the feed-cylinder B—I regulate by the instrumentality of the following mechanisms: At the side of the loom opposite to that which carries the chief elements of the before-described take-up mechanism is a gear-wheel Q, attached to the end of the feed-cylinder B, which wheel meshes in a pinion R, attached to a short shaft R', journaled on the frame A and parallel with the axis of the cylinder B. To the outer end of this short shaft is attached a worm-wheel S, with which engages a worm T' on a shaft T, which is extended along the outside of the frame A to the front end thereof, as shown in Figs. 2 and 3 of the drawings.

On the central portion of the shaft T is loosely mounted a bevel-pinion *n*, which engages a corresponding bevel-pinion *n'*, which, in common with a pinion *r*, is attached to a bolt *t*, passing through slot *t'* in the frame A. Said pinion *r* meshes with a pinion *r'*, fixed to the counter-shaft K'. The loose pinion *n* on the worm-shaft T thus receives motion from said counter-shaft. The hub of the pinion *n* is provided with a clutch-face *o'*, and adjacent thereto is a clutch member *o*, mounted on the shaft T and having a groove by which it slides on a spline on said shaft. A rod *p* is

extended from the clutch-member *o* toward the front end of the loom to be manipulated thereat. By pushing this rod rearward the clutch member *o* is thrown into engagement with the clutch-face of the pinion *n*, and thus the shaft T is caused to partake motion from the said pinion, and the rotation of said shaft imparts rotation to the feed-cylinder by the medium of the worm T, worm-gear S, shaft R⁴, and gears R Q. The front end of the shaft T, I adapt for the attachment of a hand-crank *u*, by which to turn the said shaft in a reverse direction and thereby turn the feed-cylinder B, so as to wind the warp thereon, the clutch member *o* being in the meantime held out of engagement with the pinion *n*.

Inasmuch as the shaft of the winding-roller H when in motion is rotated at a uniform speed, it is obvious that the gradual increase of the circumference of the cloth on said roller produces a corresponding increase of the speed of the take-up of the cloth. For the purpose of regulating the let-off motion of the warp-carrying cylinder, I employ interchangeable bevel-pinions *n'*, with companion pinions *r* of different diameters. The attachment of said interchangeable pinions I accomplish by means of a collar V, which is rigidly secured to the inner side of the frame A, and is provided with a slot *s*, which is horizontal or parallel with the shaft T. A bolt *t* passes through the hubs of the pinions *n'* and *r* and through the side of the frame A and slot *s* of the collar V, and is provided at its inner end with a nut U, by which it is clamped on the collar V. The outer end of said bolt is sustained by a sleeve *n''*, formed thereon and having the shaft T extending through it. By removing the nut U from the bolt *t* and detaching from the frame A the boxes which support the shaft T, and then carrying the said shaft laterally away from the said frame, the bolt *t* is withdrawn from the pinions *n'* and *r*, and another set of pinions of the required diameters can be applied to the bolts, and then, by shifting the bolt in the slot *s* and along on the shaft T and replacing the latter in its bearings or boxes on the frame A, the aforesaid pinions are adjusted in position to engage with the pinions *n* and *r'*, and are so retained by applying and tightening the nut U on the inner end of the bolt *t*.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the loom-frame and cloth-guiding and cloth-winding rollers, of a gravitating frame hinged to the rear end of the loom-frame and having its free end under the front end of said frame, a cloth-tensioning roller mounted on the front end of the gravitating frame, segmental racks secured to the sides of the front end of the loom-frame, a horizontal shaft journaled to the front end of the pivoted frame, and pinions secured to the ends of said shaft and

traveling in the racks, substantially as and for the purpose set forth.

2. The combination, with the loom-frame, cloth guiding and winding rollers, and the actuating-shafts and gears of said winding-roller, of a clutch for throwing the actuating-shaft of a winding-roller in and out of gear, a gravitating frame under the front portion of the loom-frame, a cloth-tensioning roller mounted on said gravitating frame, a weighted arm, and a crank or eccentric pivoted in common on the loom-frame to operate in unison, a rod connecting the crank or eccentric with the movable member of the aforesaid clutch, and a coupling adapted to transmit motion from the gravitating frame to the weighted arm in the approach of the frame to the extremes of its movements, substantially as set forth.

3. The combination, with the loom-frame, cloth guiding and winding rollers, and the actuating-shafts and gears of said winding-roller, of a clutch for throwing the actuating-shaft of the winding-roller in and out of gear, a gravitating frame under the front portion of the loom-frame, a cloth-tensioning roller mounted on said gravitating frame, a weighted arm, and a crank or eccentric pivoted in common on the loom-frame, a rod connecting the crank or eccentric with the movable member of the aforesaid clutch, a rod depending from the weighted arm, a rod extended from the gravitating frame and having an eye loosely embracing the pendent rod, and collars fixed to the pendent rod above and below the aforesaid eye, with a vertical play for the latter between the collars, substantially as described and shown.

4. In combination with the counter-shaft K', provided with the pinion *r'*, and the feed-cylinder B, provided with the gear-wheel Q, the pinion R, and worm-wheel S, fixed to one and the same shaft, the shaft T, having the worm T', the bevel-pinion *n*, mounted loosely on the shaft T and provided with the clutch-face *o'*, the clutch member *o*, the bevel-pinion *n'* and pinion *r* on one and the same stud and meshing, respectively, in the pinion *n* and pinion *r'*, substantially as described and shown.

5. In combination with the driving-shaft K, counter-shaft K', gears transmitting motion from the said driving-shaft to the counter-shaft, the pinion *r'* on the latter shaft, and the feed-cylinder B, provided with the gear-wheel Q, the pinion R, and worm-wheel S, fixed to one and the same shaft, the shaft T, having the worm T', the bevel-pinion *n*, mounted loosely on the shaft T and provided with the clutch-face *o'*, the clutch member *o*, the bevel-pinion *n'* and pinion *r* on one and the same stud, and meshing, respectively, in the pinion *n* and pinion *r'*, substantially as described and shown.

6. In combination with the loom-frame, shaft K', pinion *r'*, and the shaft T, provided with

the bevel-pinion *n*, the collar *V*, secured to the frame and provided with the slot *s*, the bolt *t*, passing through said slot and clamped adjustably on the said collar, and interchangeable pinions *n' r*, journaled on said bolt, substantially as described and shown.

In testimony whereof I have hereunto signed my name and affixed my seal, in the presence

of two attesting witnesses, at Cortland, in the county of Cortland, in the State of New York, on this 4th day of February, 1887.

CHESTER F. WICKWIRE. [L. S.]

Witnesses:

E. KEATOR,
R. H. DUELL.