

No. 687,813.

Patented Dec. 3, 1901.

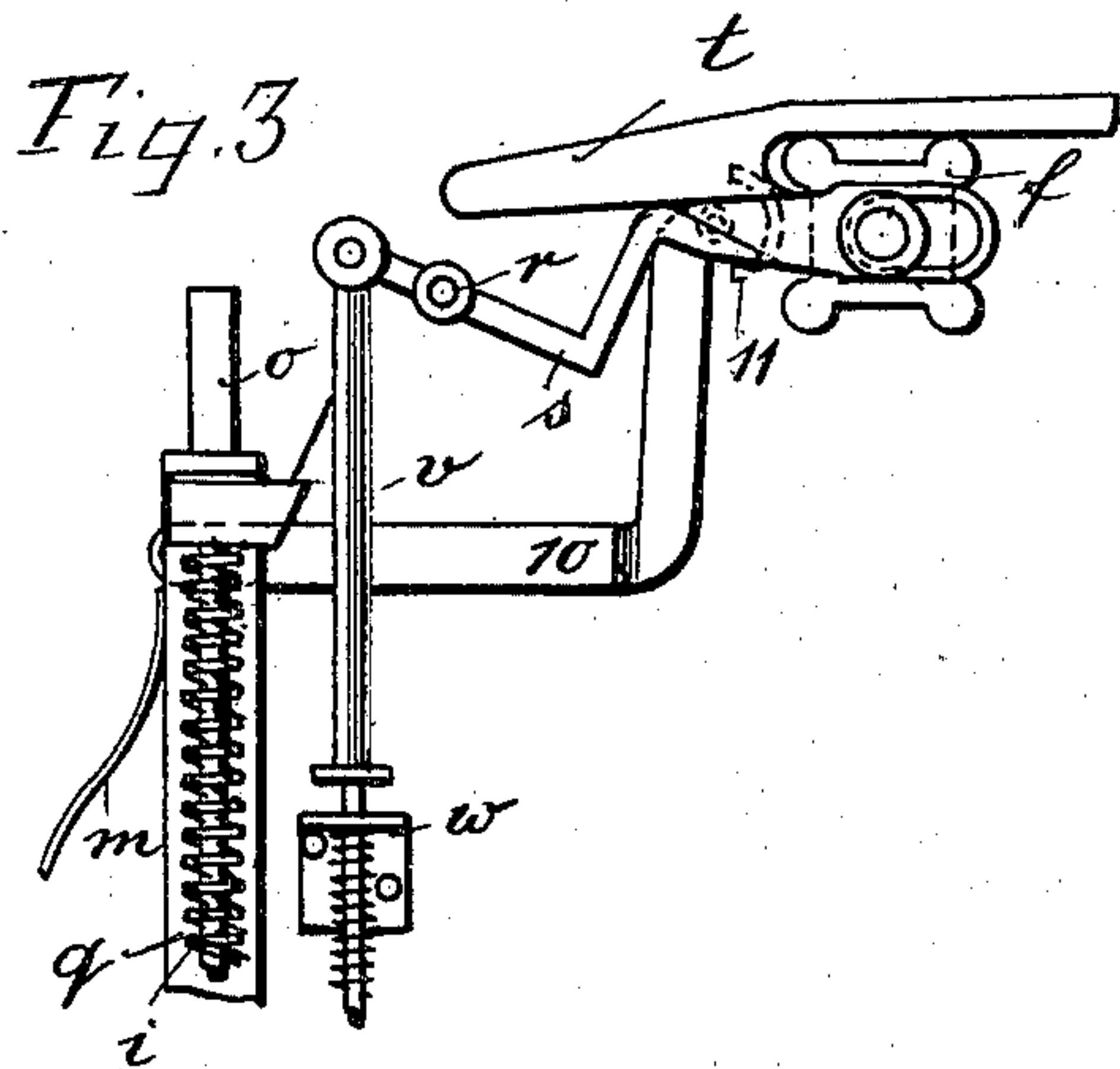
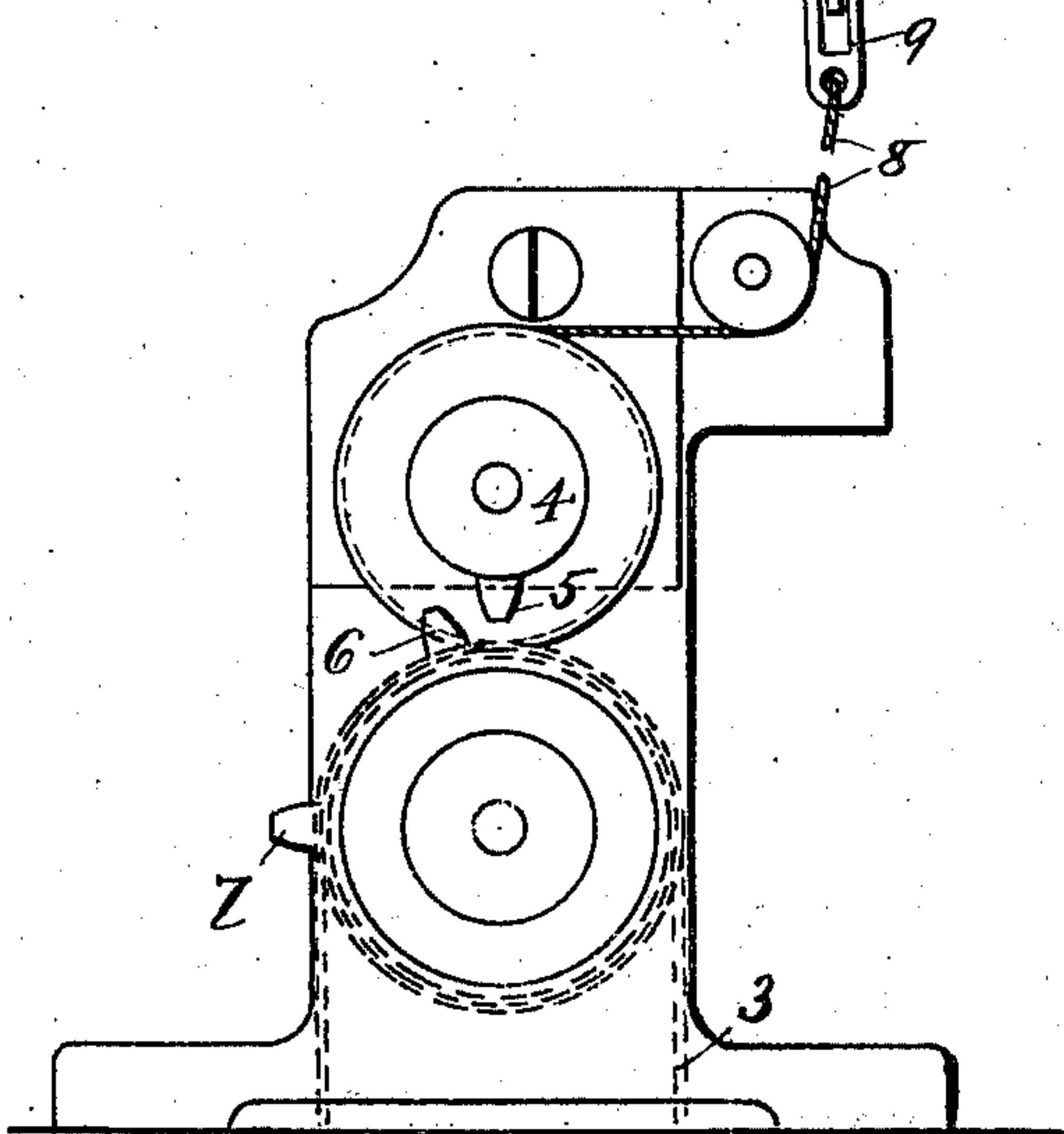
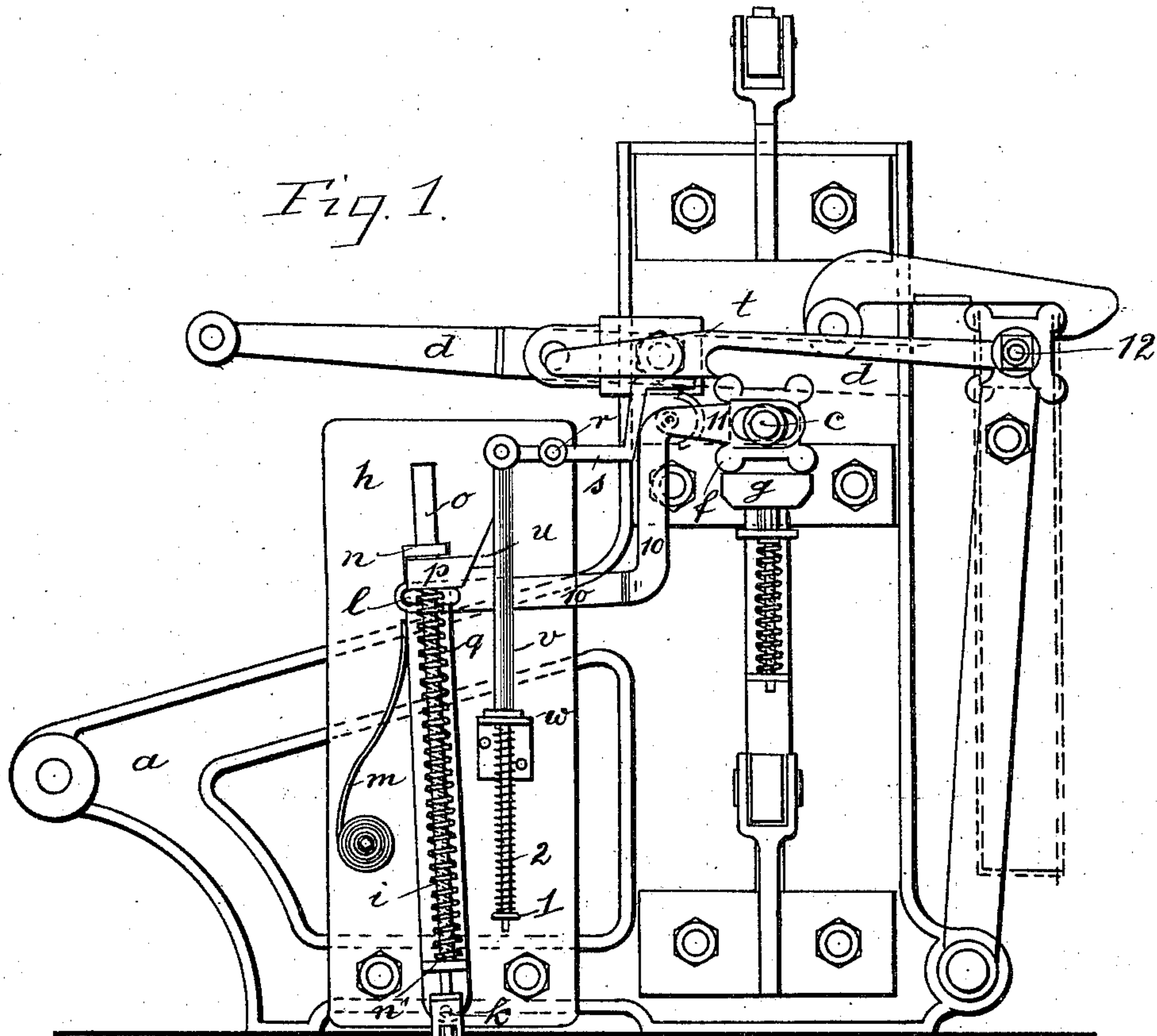
P. BENDIX.

JACQUARD MECHANISM FOR LOOMS.

(Application filed Mar. 22, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
L. Staden. J. Staden.

Inventor:
Paul Bendix.
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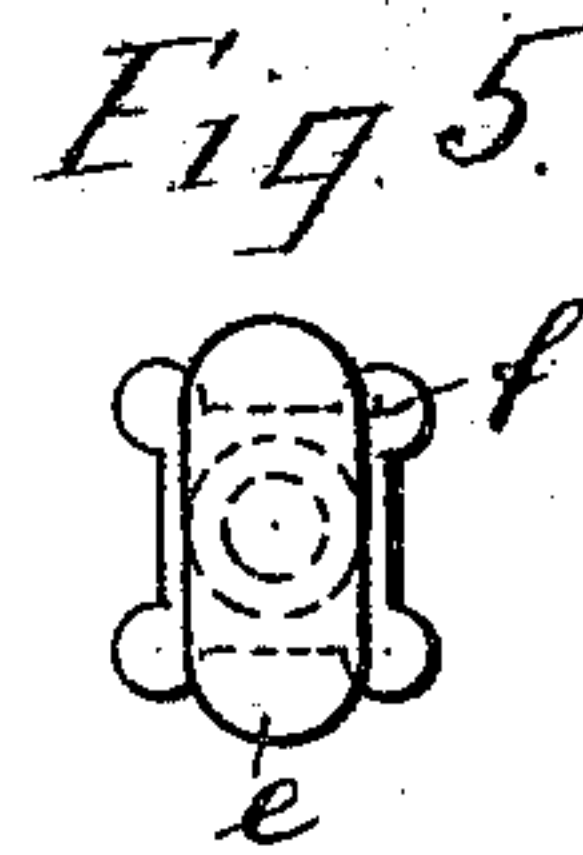
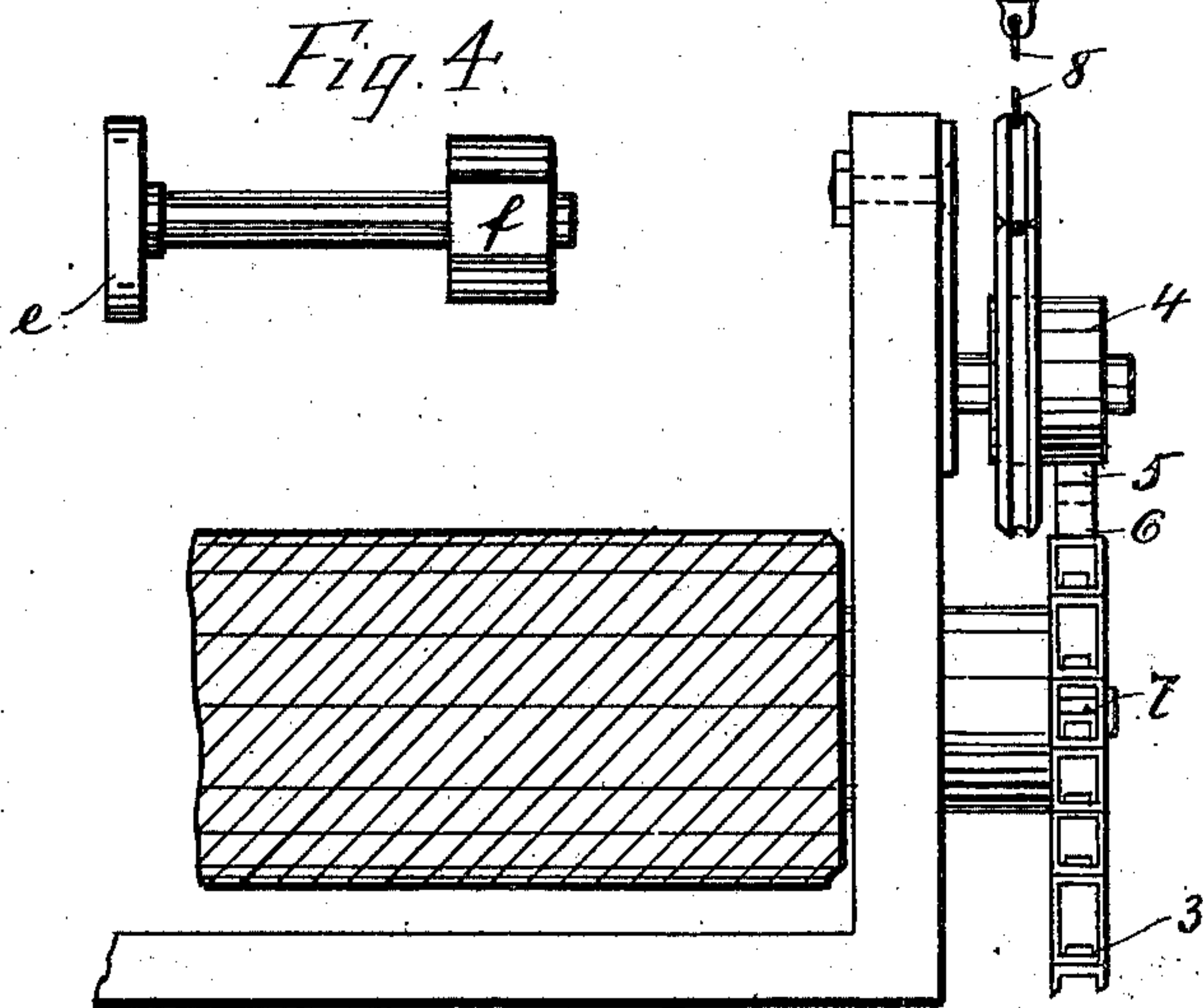
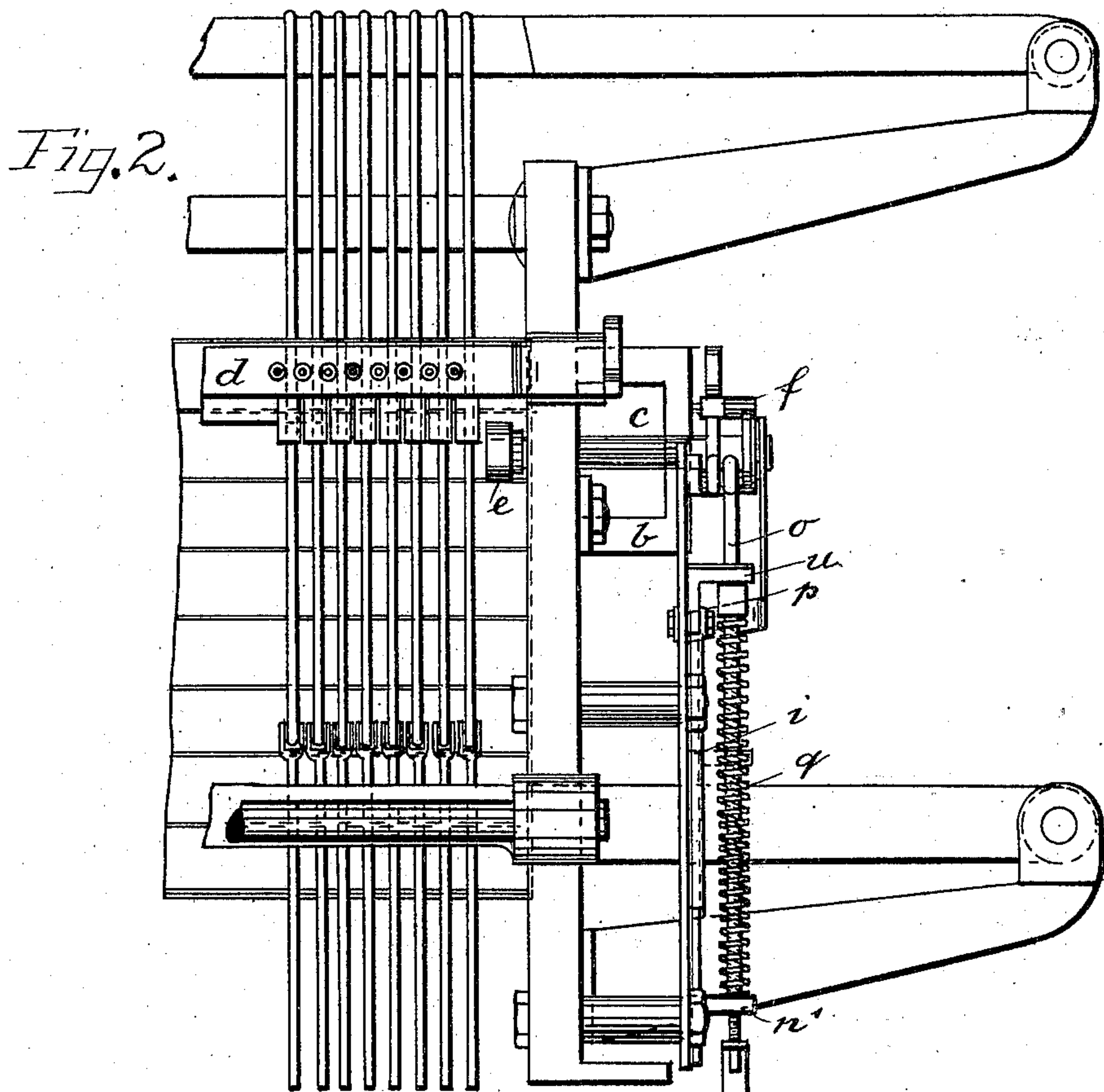
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JACQUARD MECHANISM FOR LOOMS.

(Application filed Mar. 22, 1901.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses:

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J. Staaden.

Inventor:

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UNITED STATES PATENT OFFICE.

PAUL BENDIX, OF DULMEN, GERMANY.

JACQUARD MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 687,813, dated December 3, 1901.

Application filed March 22, 1901. Serial No. 52,298. (No model.)

To all whom it may concern:

Be it known that I, PAUL BENDIX, a citizen of Germany, residing at Dulmen, in the Province of Westphalia, Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Jacquard Mechanism for Looms, of which the following is a specification, reference being had therein to the accompanying drawings.

The subject of the present invention is improved apparatus for automatically alternating ground and weft-border patterns in weaving with leaf-loom, jacquard-machines, and reversing looms. Hitherto in weaving with leaf-loom the alternating of the patterns has had to be effected by the hand of the weaver, in the case of jacquard-machines either by hand or automatically by means of the pattern-card, and with reversing looms automatically by the pattern-card. Hand alternation, however, presents certain drawbacks, inasmuch as the operation is uncertain and occupies much time. Automatic alternation by means of the pattern-card has the disadvantage that the change can only be effected according to the number of weft-threads, so that, since an equal number of weft-threads does not always produce the same length of article, it is not possible to weave to a definite length. These defects are overcome by means of the present invention, which enables the ground and weft-border patterns to be alternated exactly according to the length of the article, as also automatically.

The invention as applied to a leaf-loom is shown in the annexed drawings.

Figure 1 is an end elevation of a portion of a loom to which the invention has been applied. Fig. 2 is a portion of the same shown in front elevation. Figs. 3, 4, and 5 are detail views to be hereinafter referred to.

a is the framing of the loom, to which a frame *b* is secured, carrying a shaft *c*, on one end of which, below the needle-frame *d*, is mounted a double wiper *e*, having the form of a flat ellipse. At the opposite end of the shaft *c* is mounted a square-shaped cam *f*. A spring-plate *g* is provided below this cam to insure its assuming the correct position of rest after each operation. Figs. 4 and 5 by side and end views, respectively, show the shaft *c* with wiper *e* and cam *f* separately.

To the framing *a* of the loom is also secured a plate *h*. To the latter is pivoted at *k* a lever *i*, guided at its upper end by a slot *l*. The lever *i* is kept in its normal position by means of the spring *m*. Lugs *n* and *n'* are provided on the lever *i*, and in these lugs slides a rod *o*, which below the lug *n* carries a toe *p* and below the lug *n'* is provided with a screw-thread. Between the toe *p* and lower lug *n'* is arranged a spiral spring *q*, by means of which the toe *p* is kept pressed against the upper lug *n*. To the plate *h* is also pivoted at *r* a double-armed lever *s*, the one arm of which is bent so as to constitute a surface to support the sliding draw-hook *t*, which is secured to the shaft 12 of the card-cylinder, and thus receives a reciprocating motion. The other end of the lever *s* is jointed to a rod *v*, at the upper end of which is provided a toe *u*. This rod *v* is guided in a lug *w*, secured to the plate *h*, and is provided with a nut 1 at its lower end to form an abutment for a spiral spring 2, which encircles the lower part of the rod *v* and bears against the lug *w* above. By means of this spring 2 the rod *v* is drawn downward.

During the weaving operation the hook *t* occupies the position shown in Fig. 1, reciprocating inoperatively upon the plane surface presented by the bent end of the lever *s*. In order, now, to change the pattern from ground to weft-border pattern, or vice versa, this support *s* must be removed. The manner in which this operation is effected will now be described.

Above the chain 3, determining the length of the article being woven, a grooved pulley 4 is arranged, provided with a tooth or nose 5. 6 and 7 are two similar projections on the chain 3, and when the pattern is to be changed one or other of the noses 6 7 contacts with the nose 5. The latter will thus be carried along through a certain distance, whereby a partial rotation of the pulley 4 is effected and its rope 8 correspondingly wound up. The other end of this rope is secured to a nut 9, screwed to the rod *o*, so that by a partial rotation of the pulley 4 the rod *o* is drawn downward against the action of the spring *q*. The toe *p* will, as the rod *o* is drawn down, slide off the toe *u* and by the action of spring *m* will be pushed below this toe *u*. When, now, the nose 6 or 7 releases

the nose 5, the spring *q* will project the rod *o* upward, and the toe *p*, pushing against the toe *u*, will cause the rod *v* to rise likewise. The result will be that the lever *s* will turn on its fulcrum and the bent arm will be removed from the hook *t*. (See Fig. 3.) The hook *t* being thus unsupported falls upon the cam *f* and will engage one of the rounded corners of the latter. On retreat of the hook *t* through motion of the card-cylinder the cam *f* will thus be given a quarter-rotation, a corresponding rotation being transmitted to the wiper *e*. According as the latter at the moment occupies a vertical or horizontal position the quarter-rotation will cause it to take up a horizontal or vertical position, and thus respectively raise or lower the needle-frame *d*, whereby the pattern is changed as desired. As the cam *f* rotates one of its corners will contact with a projection 11, secured to a bent arm 10, the slotted upper end of which embraces the shaft *c*, while the other end is connected to the lever *i*. The cam *f* will thus displace the lever *i* laterally, whereby the toe *p* will be released and again pressed upward against the lug *n* by the spring *q*. When the cam *f* has completed a quarter-rotation, the lever *i* under the influence of spring *m* will return to its original position. The toe *u* and the lever *s* will likewise again take up their first position. The lever *s* is thus again brought under the hook *t*, which will thus again commence to reciprocate upon the support thus presented. This cycle of operations will be repeated each time the nose 5 is engaged by one of the projections 6, 7 on the chain 3.

It will be clear that the invention may be equally well applied to other descriptions of loom.

The device for effecting the connection between the contrivance for determining the length of the article being woven and the machine and the manner of actuating the latter by such contrivance may obviously be other than that described without the main feature of the invention being departed from.

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

1. Apparatus for automatically alternating ground-pattern and weft-border pattern in figure-weaving, comprising in combination a spring-lever pivoted to a stationary loom part, a device for determining the length of the article being woven, a spring-rod carried by said lever and operated by said device, a card-cylinder shaft, a reciprocating drawing-hook mounted on said shaft, a device for normally supporting said hook, means for enabling the said rod on being actuated to remove said support, a shaft mounted in the loom-framing, a double wiper mounted at one end of said shaft adapted to actuate the needle-frame, a cam at the other end of said shaft engaging with said hook on rotation and means actuated by said cam whereby said le-

ver, rod and hook can be returned to their position of rest, all arranged in such manner that when the rod is actuated, the said hook engages the cam, whereby the wiper is caused to actuate the needle-frame and alter the pattern, the cam then operating the device for returning the said lever, rod and hook to their first position, substantially as described.

2. Apparatus for automatically alternating ground-pattern and weft-border pattern in figure-weaving, comprising in combination a spring-lever *o* pivoted to a stationary loom part, a device for determining the length of the article being woven, a spring-rod *i* carried by said lever and operated by said device, a spring-rod *v* engaged by said rod *i* on operation, a bent lever *s* pivoted to a stationary loom part and jointed to said rod *v*, a card-cylinder shaft, a reciprocating drawing-hook *t* mounted on said shaft and normally sliding upon one end of said lever *s*, a shaft *c* carried by the loom-framing, a double wiper *e* secured at one end of said shaft adapted to lift and sink the needle-frame, a cam *f* at the other end of said shaft engaging with said hook *t* on rotation, means *g* for adjusting said cam, a bent arm 10, one slotted end of which embraces the said shaft *c*, while the other end is secured to said lever *i*, and a nose 11 carried by said arm 10 struck by said cam *f* in its rotation, all arranged in such manner that when the rod *o* is operated it engages the rod *v* and removes lever *s* from hook *t*, whereupon the latter engages and rotates cam *f*, the wiper *e* of the cam-shaft *c* actuates the needle-frame and alters the pattern, and the cam *f* then strikes the nose 11 and causes the various members to return to their original positions, all substantially as described.

3. The means for effecting operation of the needle-frame by the pattern-card-cylinder mechanism, comprising a shaft *c* mounted in a stationary loom part, the needle-frame *d* and a double wiper *e* mounted at one end of said shaft *c* and actuating the needle-frame in its rotation, and a square-shaped cam *f* having projecting corners mounted at the other end of said shaft, in combination with a drawing-hook *t* reciprocated by the card-cylinder mechanism, so as to rotate said cam and wiper, substantially as described.

4. The device for operating the rod *i*, comprising in combination a rotating chain for determining the length of the article being woven provided with projections 6, 7, a pulley provided with a projection 5 engaged by the chain projections 6, 7 so as to cause rotation of said pulley, and means for transmitting the motion of said pulley to the rod *i*, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

PAUL BENDIX.

Witnesses:

RUDOLPH W. HIEBL,
SIGMUND FALK.