

W. TAYLOR.
Looms for Weaving Wire.

No. 152,531.

Patented June 30, 1874.

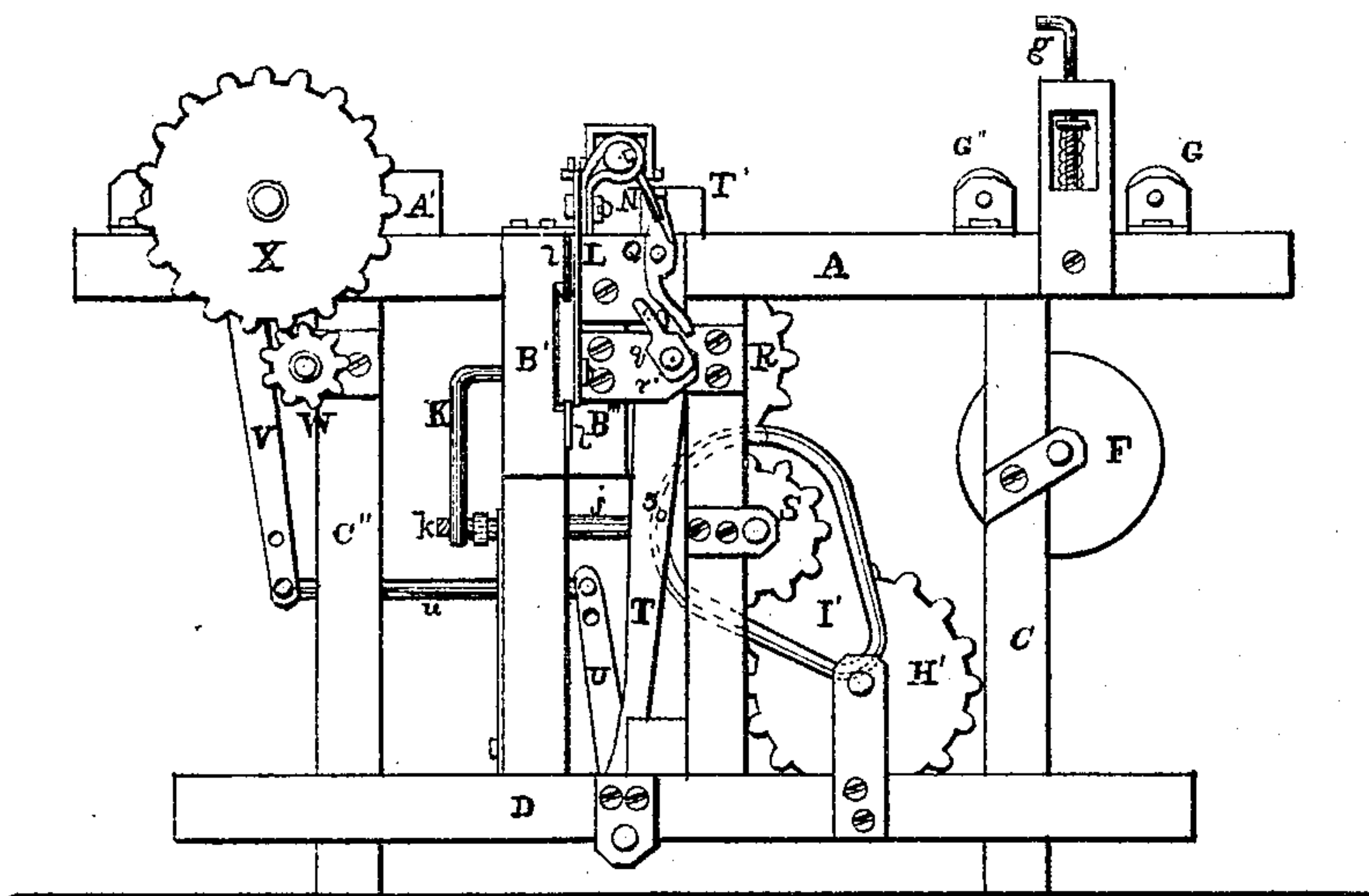


Fig. 1

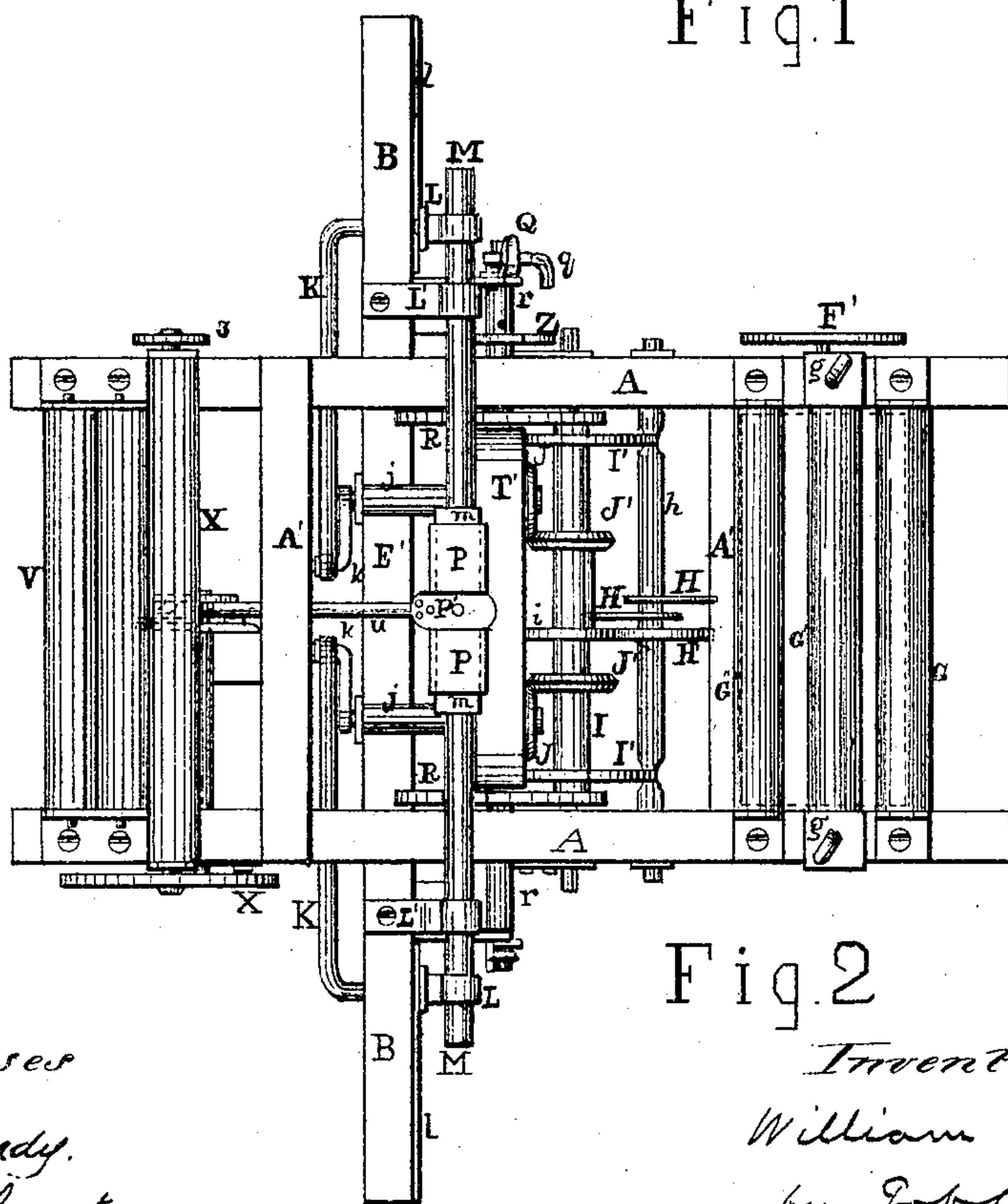


Fig. 2

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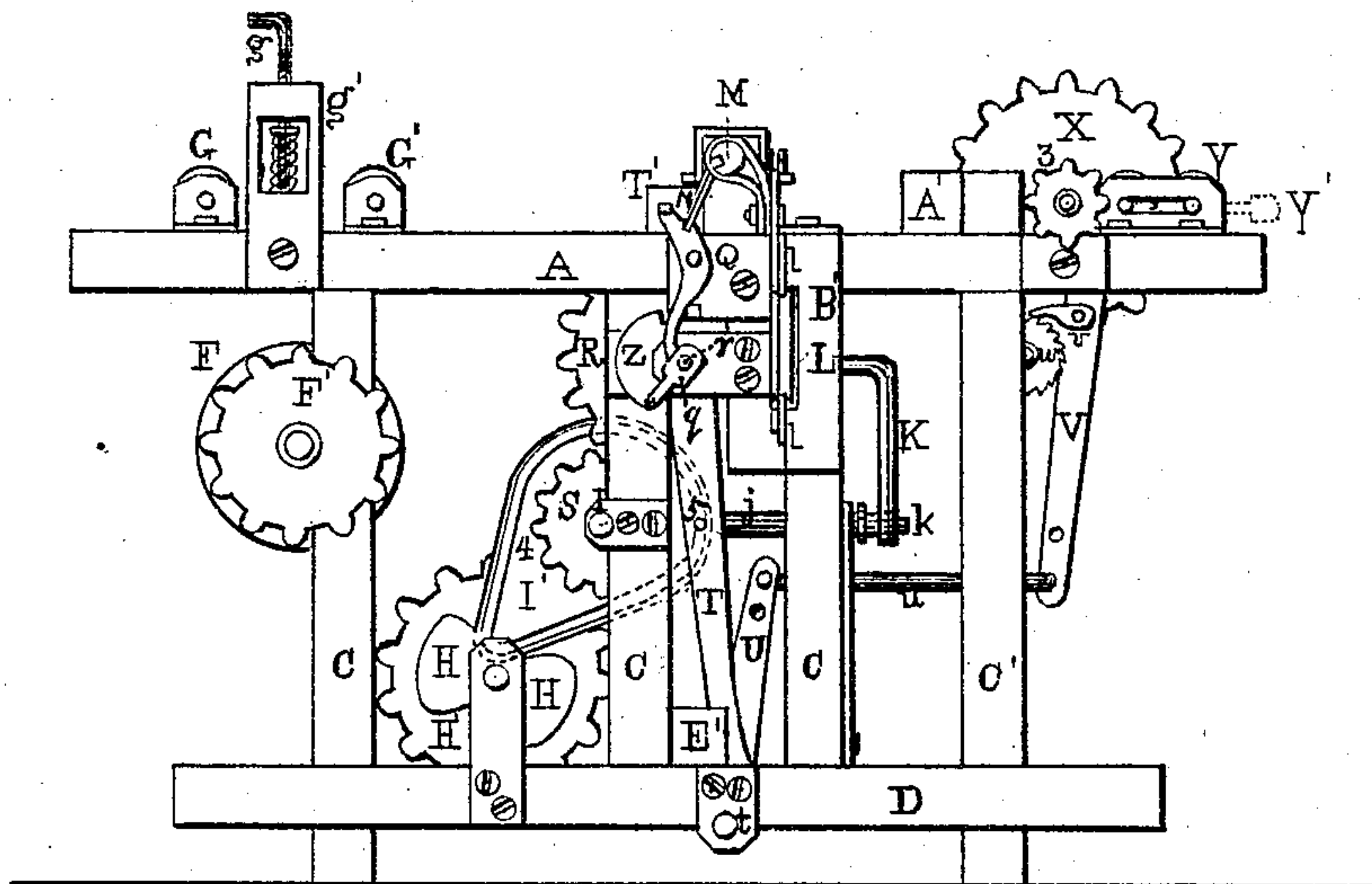


Fig. 3.

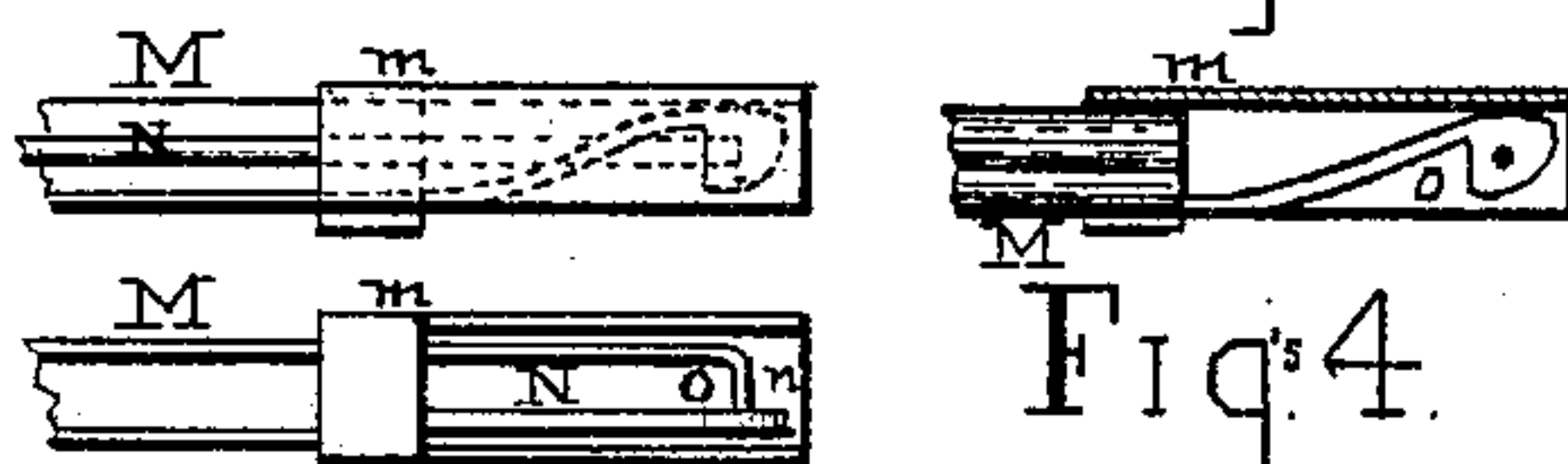


Fig. 4.

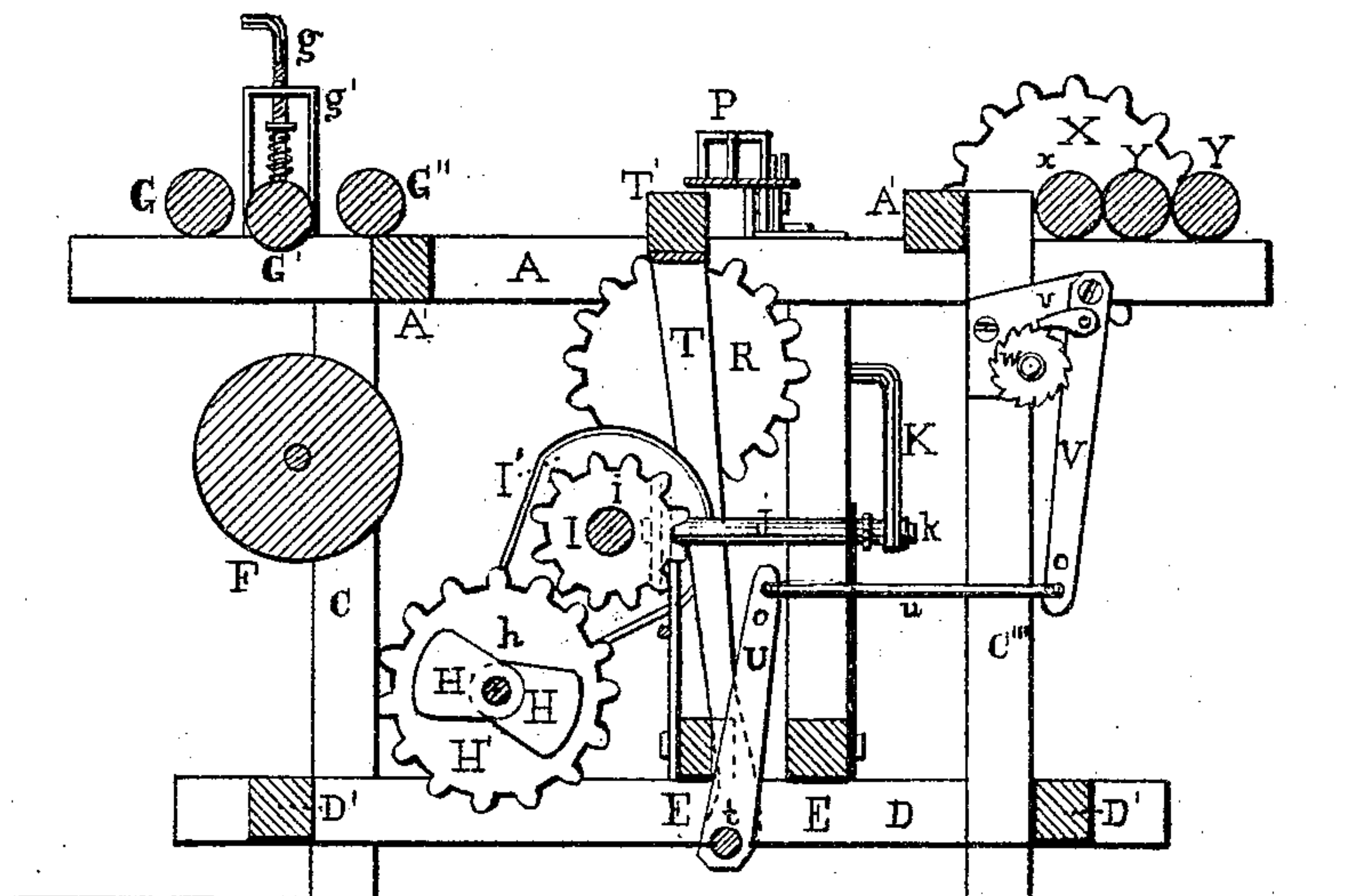


Fig. 5.

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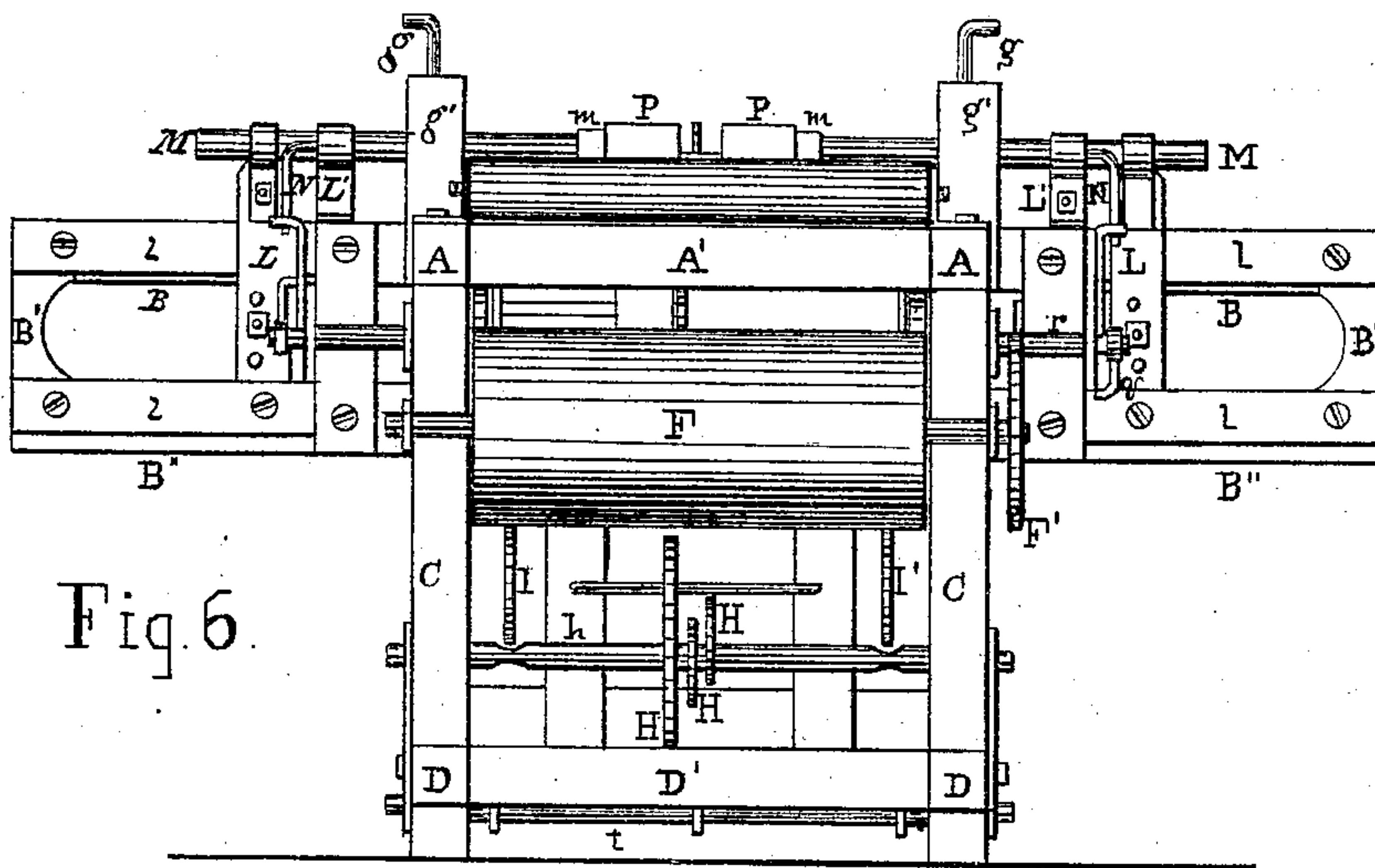


Fig. 6.

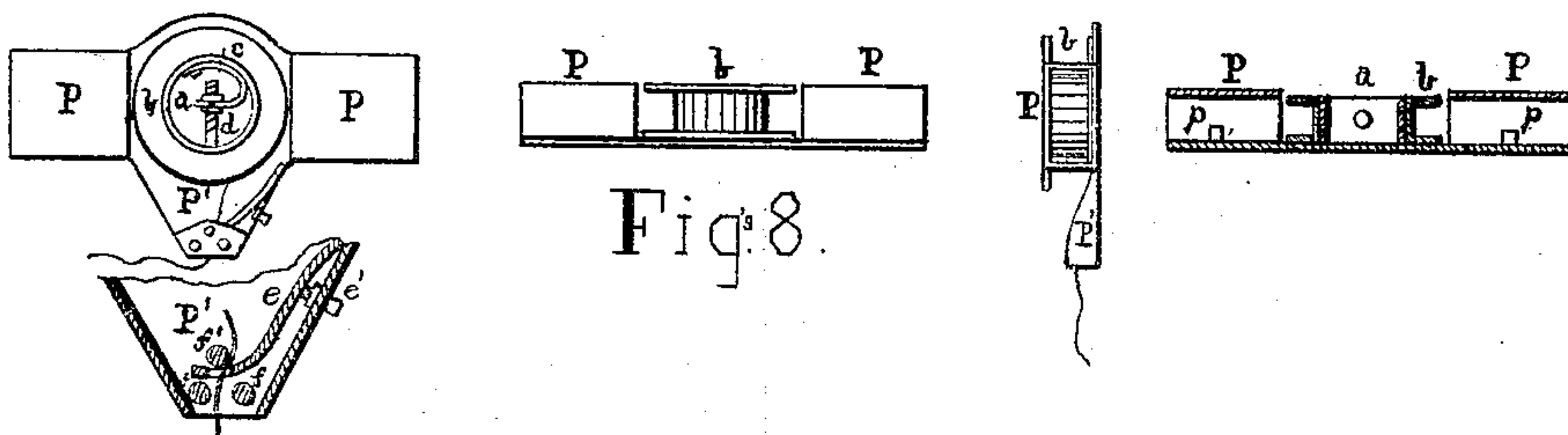


Fig. 8.

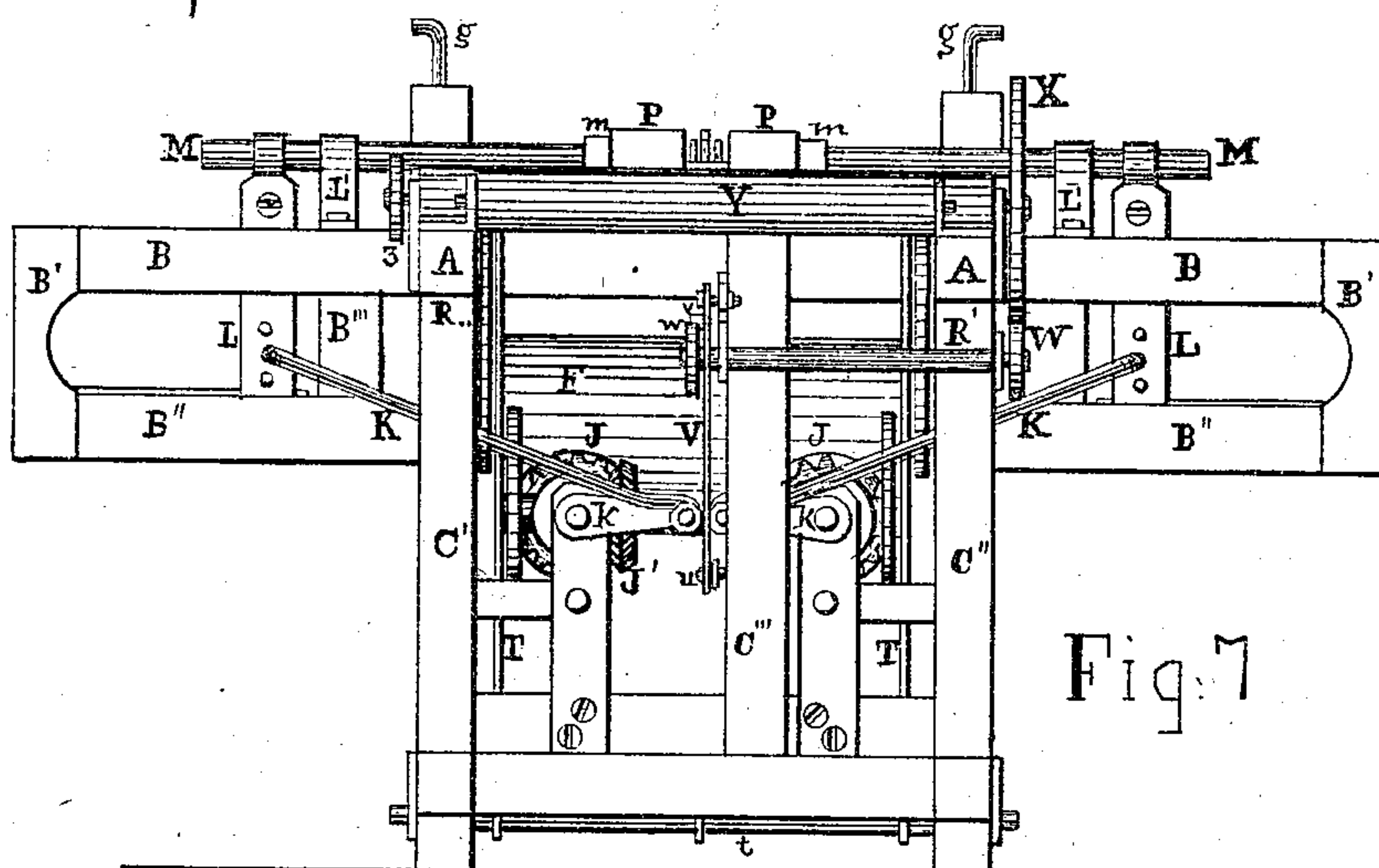


Fig. 7.

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UNITED STATES PATENT OFFICE.

WILLIAM TAYLOR, OF MASSILLON, OHIO.

IMPROVEMENT IN LOOMS FOR WEAVING WIRE.

Specification forming part of Letters Patent No. **152,531**, dated June 30, 1874; application filed February 25, 1873.

To all whom it may concern :

Be it known that I, WILLIAM TAYLOR, of Massillon, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Power Wire-Looms; and that the following is a full, clear, and exact specification thereof, which will enable others skilled in the art to make and use the said invention.

My invention relates to that class of looms known as positive-motion looms, in which the shuttle is carried bodily through the warp, instead of being thrown through the same by the action of a knocker, and is particularly designed for power-looms adapted to wire-weaving.

Said invention consists in the novel construction of the mechanism by which the shuttle is attached to and detached from the slide-rods; also, in the novel construction of the shuttle and its tension devices; these several improvements serving to materially simplify the mechanism of the loom, and increase the accuracy of its operation.

In the accompanying drawings, Figures 1 and 3 are elevations of the sides of my improved loom. Fig. 2 is a plan of the same. Figs. 4 are detail views of the ends of the slide-rods, showing the device for attaching and detaching the shuttle. Fig. 5 is a longitudinal section of the machine. Fig. 6 is a front view of the loom, and Fig. 7 a rear view of the same. Figs. 8 are detail views of the shuttle and shuttle-spool.

The main frame consists of the uprights C C' C'', and the longitudinal beams A D, and cross-beams A' D'. An additional framework, B B' B'' B''', on which the slide-rods run, projects from each side of the machine. The warp-beam F, on which are wound the wires which are to constitute the warp of the cloth, should be ribbed to keep the different threads apart and prevent their tangling. This warp-beam F is secured to a shaft on the uprights C C, and, extending beyond one of them, carries a spur-wheel, F'. The warp-threads pass from the warp-beam F, through the tension-rollers G G' G'', passing over the roller G, under G', and over G''. Attached to the middle roller, G', is a device for regulating the tension of the warp. It consists of the

screw g, which passes through a spiral spring in the box g, and into a block in said box, in which the shaft of the roller G' is journaled. The upper end of the spring is rigidly attached to the screw g, and the lower end to the block, so that by turning the screw g, the pressure on the block can be increased or diminished, and the tension of the warp-threads thus adjusted.

The part of the frame of the loom on which the slide-rods are supported is composed of the horizontal beams B B'' and the vertical beam B', the beams B B'' having metallic plates l, Figs. 2 and 6, secured to their front sides, the edges of which project into the slot formed by the beams B B' B''. The slide rods M pass through loops L', secured to the beam B, and also through a loop on the sliding piece L, which is furnished with grooves which run on the projecting edges of the plates l. The bent rods K K are attached to the sliding pieces L L, Figs. 2 and 7, and also to the cranks k k on the shafts j j, which are at right angles with the main shaft I, and connected therewith by means of bevel-gearing J J'.

The cloth passes through the tension-rollers x Y Y, the tension of the cloth being adjusted by a screw, Y'. The ends of the shafts of the rollers Y Y rest in slots y, Fig. 3, and the screw Y', by regulating the distance between said rollers, adjusts the tension of the cloth as it passes between said rollers.

The construction of the shuttle and shuttle-spool is shown in Figs. 8. The shuttle consists of a central plate connecting two sockets, P P, which slip over the ends of the slide-rods M M, said central plate having also a projection, P', the sides of which are turned up and connected by a top piece. On the bottom of each of the sockets P is a small projection, p, the object of which will be explained hereafter. Secured to the central plate of the shuttle is a hollow circular standard, a, on which the shuttle-spool b (of the ordinary spool form) fits. A small hole is made in the standard, (shown in right-hand detail,) and near the opposite side of said standard (see left-hand detail) a curved spring, c, is secured, to the free end of which a pin, d, is attached, which is inserted in said hole, and is pressed

against the shuttle-spool by the spring *c*, thus resisting the tendency which the elasticity of the wire gives to the spool to turn round and loosen the tension of the wire without feeding it off. In the projection *P'* of the shuttle is a device for regulating the tension of the wire as it is fed out to form the weft of the cloth. Three pins, *f' f f*, on each of which is a loose roller, are secured vertically across the mouth of the shuttle, the rear pin, *f'*, being placed back of the space between the pins *f f*. A spring, *e*, is secured to one side of the projection *P'*, the free end passing between the pin *f'* and pins *f f*, and having an opening opposite the space between the pins *f f*, through which the weft-wire is passed. A screw, *e'*, in the side of the projection presses against the spring *e*, so that the tension of the wire can be regulated by adjusting the said screw.

The mechanism by which the shuttle *P* is attached to and detached from the slide-rods *M M* is shown in Fig. 4 of the drawings. To the inner end of each of the slide-rods *M* a head, *m*, open at the bottom, is attached, said head *m* being shaped to fit into the socket *P* of the shuttle. Within the head is a spring, *o*, with a hook end, which hook, when the head *m* slides into the socket *P*, catches on the projection *p* in said socket, and holds the two firmly together. The slide-rod *M* is furnished with a longitudinal groove, in which is inserted a rod, *N*, which is bent at both ends. The inner end of this rod *N* extends into the head *m*, and the bent end *n* is attached to the hook on the spring *o*, so that when the rod *N* is turned, which is done by a mechanism engaging the outer end of said rod, and which will be hereafter more fully described, the inner bent end *n* raises the spring *o* and disengages the hook from the pin *p*, thus releasing the shuttle from the slide-rod.

The mechanism for operating the rods *N*, which attach and detach the slide-rods and shuttle, is located mainly outside of the main frame. It consists of a shaft, *r*, Figs. 2 and 3, placed about midway between the slide-rods *M* and main shaft *I*, and having a bent arm, *q*, on its outer end, and a spur-wheel, *R*, on its inner end, which engages a pinion, *S*, on the main shaft. To a support on the beam *B'''*, and above the shaft *r*, a two-armed piece, *Q*, is attached, Figs. 1 and 3, having such a position in relation to the shaft *r* and slide-rod *M* that the revolution of the shaft *r* brings the bent arm *q* in contact with the lower arm of the piece *Q* at the same time that the upper arm of said piece comes in contact with the bent end of the rod *N*, and the pressure of the arm *q* on the lower arm of *Q* causes the upper arm to turn the rod *N*, thus raising the hooked spring *o* and releasing the shuttle from the slide-rod. There is a device of this kind at each side of the machine, the two being so arranged as to act on their respective slide-rods alternately, so that when one slide-rod is attaching the shuttle the other one is releasing it. The reed or presser, which is located on the

beam *T'*, but not shown in the drawing, is operated by means of the cams *I'* on the main shaft *I*, and the arms *T*, carrying the beam *T'*, and rigidly secured to the shaft *t* in the lower part of the frame. The cams *I* are of the oblong form shown in the drawings, Figs. 1 and 3, and are furnished each with a face-groove, in which a pin, *5*, on the inner side of the arm *T* works, so that as the cams revolve on the shaft *I* they swing the arms *T* back and forth, and each time the weft-thread is carried across by the shuttle the reed on the beam *T'* strikes against said thread and drives it into its place, while the arms *T*, being rigidly attached to the shaft *t*, give to said shaft an oscillating motion, which operates the cloth-rollers *x Y Y*, in a manner hereafter to be described. The bar *U* is secured near the middle of the shaft *t*, and is connected, by the rod *u*, to a swinging bar, *V*, attached to the upright *C'''*. The bar *V* is furnished with a pawl, *v*, which engages the teeth of a ratchet-wheel, *w*. The oscillating motion of the shaft *t* is communicated to the bar *V* by means of the bar *U* and rod *u*, so that at each vibration of those parts the pawl *v* moves the ratchet-wheel *w* the width of one of its teeth. The shaft *R'* of the ratchet-wheel *w* is supported on the uprights *C'' C'''*, Fig. 7, and carries a pinion, *W*, which engages a spur-wheel, *X*, on the end of the cloth-roller *x*, Fig. 1. On the opposite end of the roller *x* is a pinion, *3*, Figs. 2 and 3, from which a train of gearing may connect it with the spur-wheel *F'* on the shaft of the warp-beam *F*, thus communicating the motion of the cloth-beam *x* to the warp-beam *F*. The rotation of the main shaft is communicated to the shafts *j* by the bevel-gearing *J J'*, Figs. 2 and 7. The cranks *k*, carrying the rods *K*, and being rigidly attached to the shafts *j*, give a reciprocating motion to said rods *K*, which is communicated, by means of the sliding pieces *L*, to the slide-rods *M*. This reciprocating motion might be communicated by the main shaft to the slide-rods *M* by means of eccentrics or any mechanical equivalent, the particular advantage of the crank-motion being the variable speed given to the slide-rods, which was referred to in a preceding part of this specification. The gearing *R S*, Figs. 1 and 3, transfers the motion from the main shaft *I* to the shafts *r*, which operate the mechanism *q Q N O* for detaching shuttle, the sizes of the gear-wheels being such that each shaft *r* revolves but once while the shaft *I* revolves twice, so that each slide-rod *M* is attached to the shuttle at one revolution of the main shaft, and detached at the next, the detaching mechanisms operating alternately. The combination of the reed with the cams *I'* on the main shaft causes it to vibrate backward and forward at each passage of the shuttle, so that each time the weft-thread is carried through the warp-threads it is driven into place by said reed, while the oscillation of the shaft *t* winds the finished cloth onto the cloth-roller by means of the mechanism *U u V v W w*.

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

1. The spring-latch *o* and rotating tripping-rod *N*, in combination with the slide-rod *M* and its head *m*, substantially as and for the purpose specified.

2. The trip-lever *Q* and revolving arm *q*, acting in combination with the rotating tripping-rod *N* on the slide-rod *M*, substantially as and for the purpose specified.

3. The shuttle consisting of the base *P'*, with sockets *P P*, and the central spool *b*, secured on a hollow spindle, *a*, containing a friction device, *c d*, the several parts being constructed and arranged substantially as and for the purpose specified.

4. The described friction tension device *c d*, arranged within the spool-spindle *a*, and serving to control the rotation of the spool *b*, substantially in the manner and for the purpose specified.

5. The shuttle provided with the slotted spring *e*, in combination with the tension-pins *f f f'*, said spring serving to regulate the tension of the filling-wire, substantially as and for the purpose specified.

As evidence of the foregoing witness my hand this 27th day of January, A. D. 1873.

WM. TAYLOR.

Witnesses:

ISAAC H. BROWN,

HORACE C. BROWN.