(No Model.) 4 Sheets—Sheet 1.

M. MOURADIAN.

APPARATUS FOR WITHDRAWING A THREAD FROM WOVEN CLOTH FOR THE PURPOSE OF TESTING IT.

No. 415,367. Patented Nov. 19, 1889.

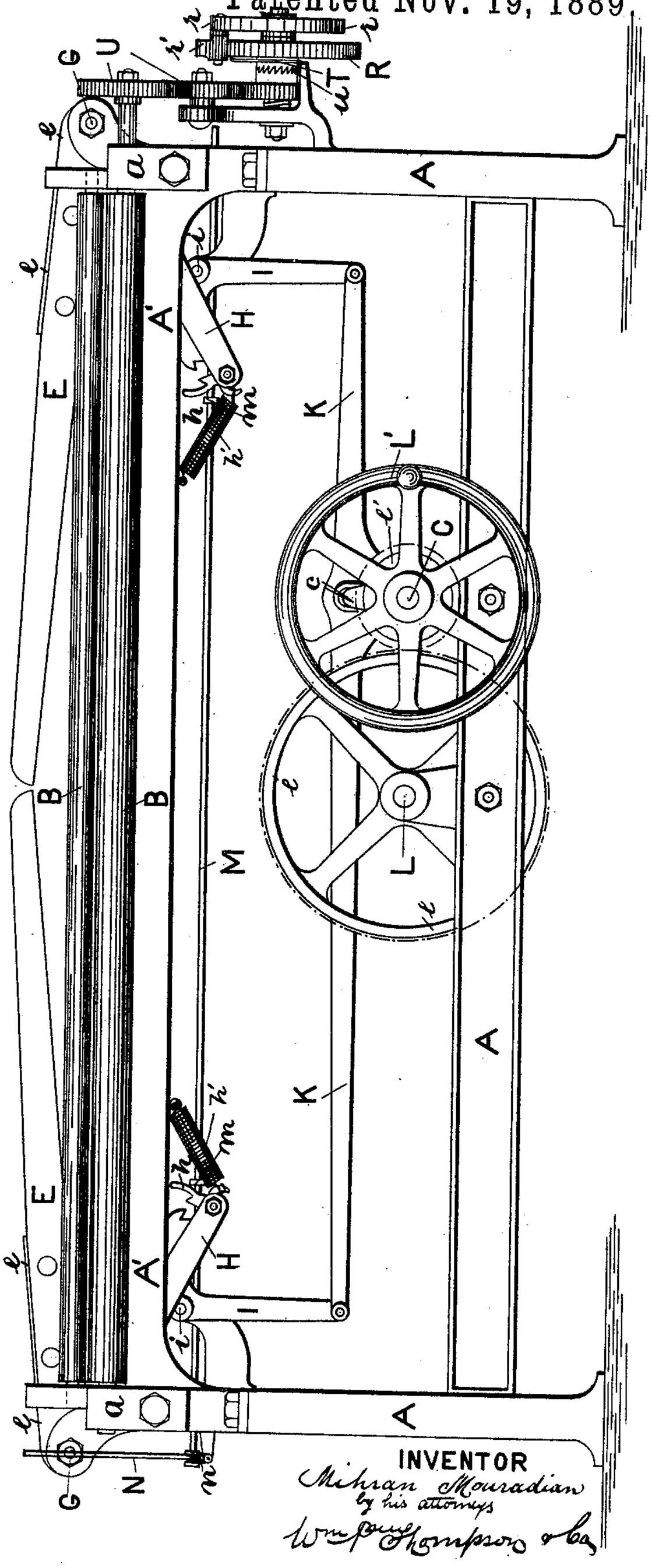

FIG: 1.

WITNESSES

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(No Model.) 4 Sheets—Sheet 2.

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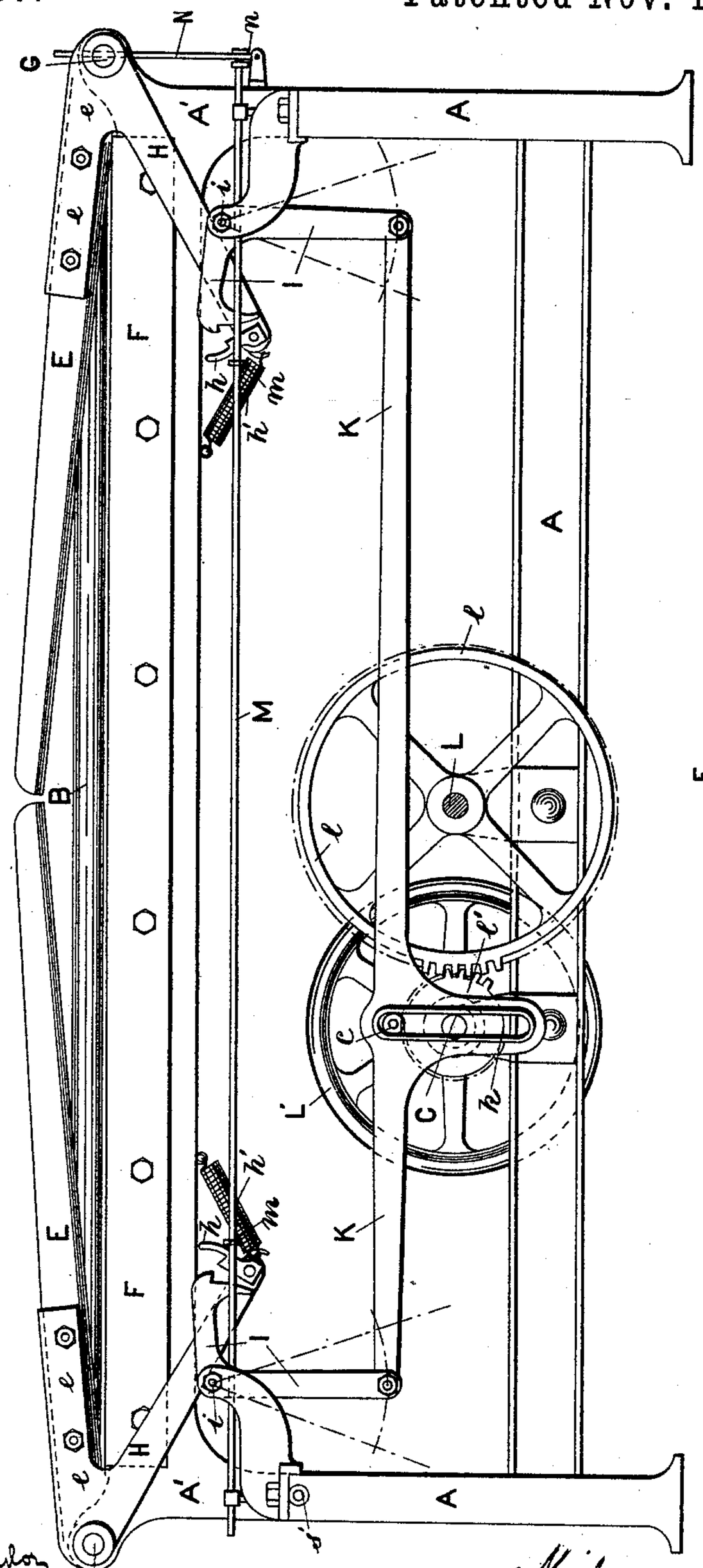

FIG: 2.

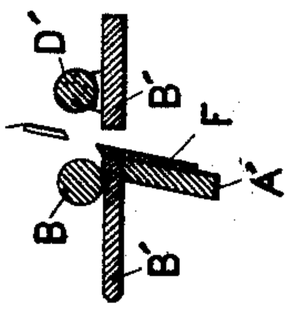

FIG: 7.

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(No Model.) 4 Sheets—Sheet 3.

M. MOURADIAN.

APPARATUS FOR WITHDRAWING A THREAD FROM WOVEN CLOTH FOR THE PURPOSE OF TESTING IT.

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FIG. 4.

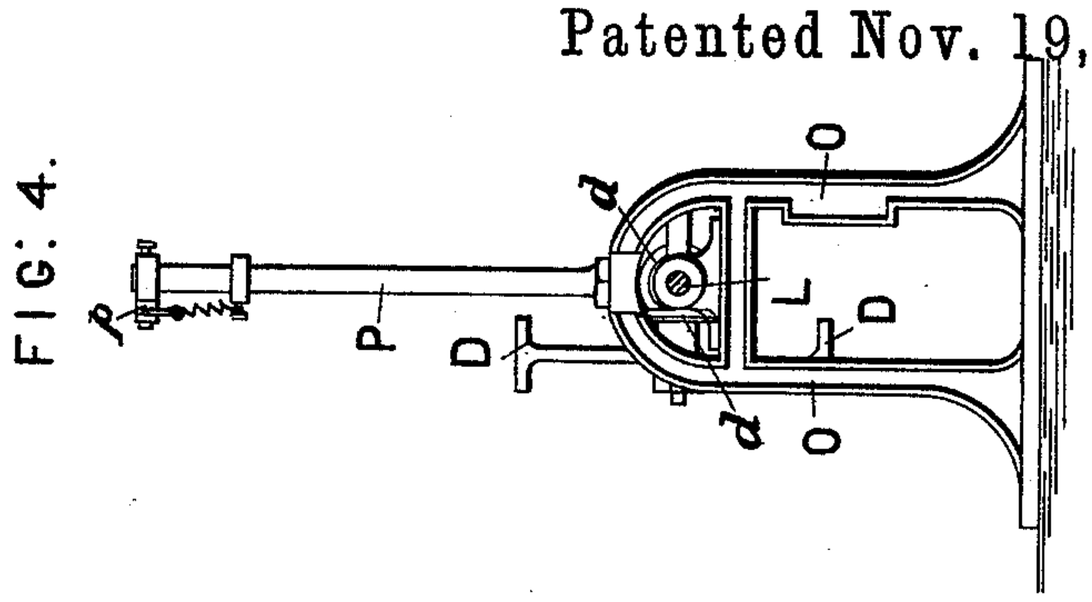
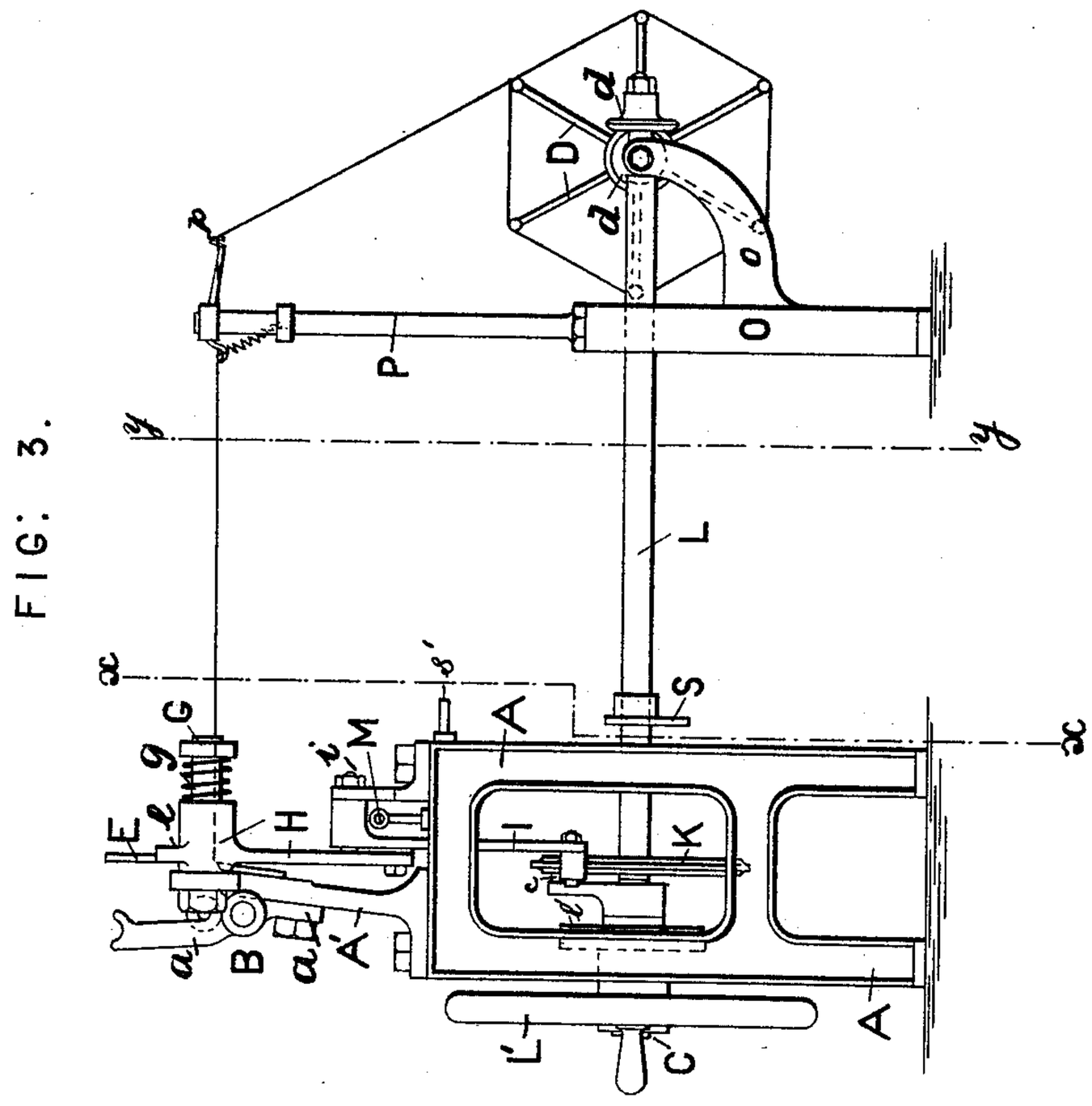


FIG. 3.



WITNESSES

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(No Model.) 4 Sheets—Sheet 4.

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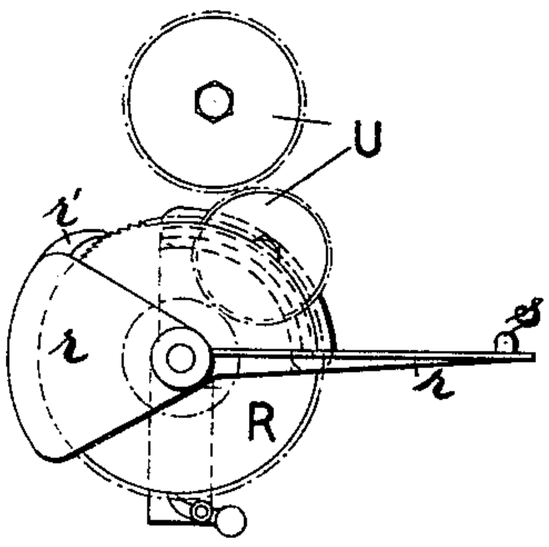

FIG: 5.

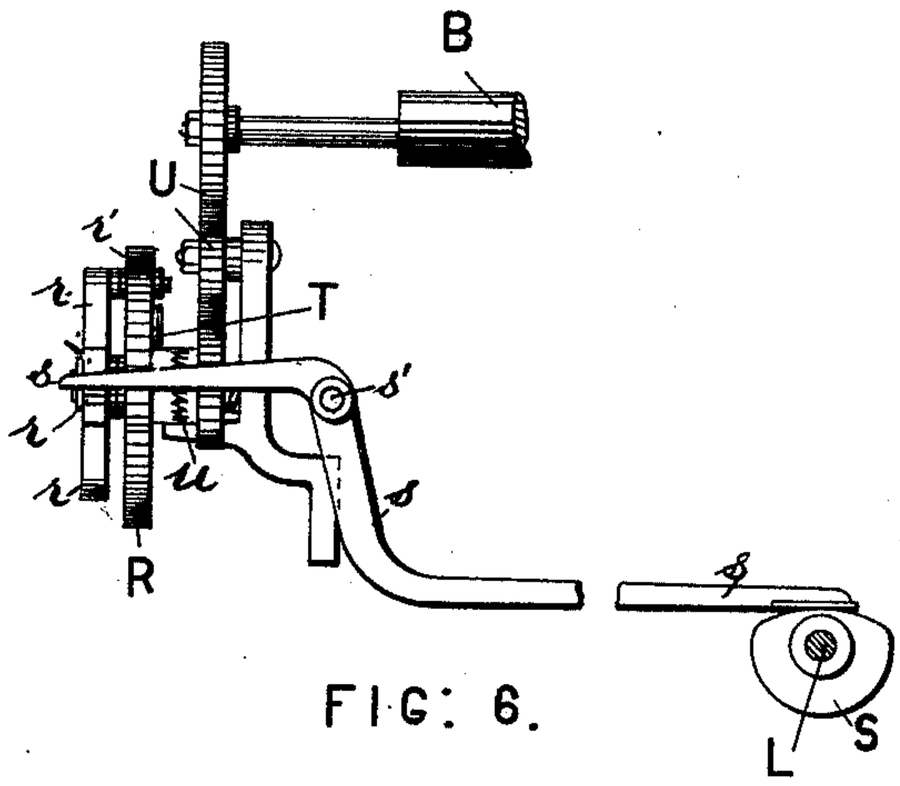

FIG: 6.

WITNESSES

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UNITED STATES PATENT OFFICE.

MIHRAN MOURADIAN, OF MANCHESTER, COUNTY OF LANCASTER, ENGLAND.

APPARATUS FOR WITHDRAWING A THREAD FROM WOVEN CLOTH FOR THE PURPOSE OF TESTING IT.

SPECIFICATION forming part of Letters Patent No. 415,367, dated November 19, 1889.

Application filed February 25, 1889. Serial No. 301,162. (No model.) Patented in England April 20, 1888, No. 5,896.

To all whom it may concern:

Be it known that I, MIHRAN MOURADIAN, of Manchester, in the county of Lancaster, England, a subject of the Sultan of Turkey, have invented certain new and useful Improvements in Apparatus for Withdrawing a Thread from Woven Cloth for the Purpose of Testing it, (for which I have obtained Letters Patent in Great Britain, No. 5,896, bearing date April 20, 1888,) of which the following is a specification.

The object of this invention is to provide a machine by means of which a certain length of the weft-yarn may be withdrawn from a woven textile fabric and reeled for the purpurpose of testing it. It is designed specially for use with gray cloth, but may be applied to other kinds of cloth where found desirable.

It consists, essentially, in an apparatus in which the weft thread or yarn will be withdrawn and reeled, while at the same time the ends of the warp-threads will be successively cut away after the weft has been withdrawn from them, as hereinafter specified and claimed.

It will be fully described with reference to the accompanying drawings, wherein is shown an apparatus constructed in accordance with the invention.

Figure 1 is a front elevation of the machine; Fig. 2, a sectional elevation on line *x x* of Fig. 3, looking toward the front of the machine, with the counting mechanism removed; Fig. 3, a side elevation of the machine with counting mechanism removed; Fig. 4, a sectional elevation on line *y y* of Fig. 3, looking toward back of machine; Fig. 5, a side elevation of counting mechanism, and Fig. 6, elevation of counting mechanism from back; Fig. 7, sectional elevation showing position of additional withdrawing-roller D′ and table B′.

Mounted on the framing A is a pair of rollers B or other suitable holders or supports, to hold and pass the cloth forward while the weft-thread is being withdrawn therefrom. I prefer to use two rollers, as shown; but a table B′ with one roller working upon it would answer to pass the cloth forward as the weft-thread is being withdrawn. The rollers are journaled in brackets *a*, fitted to the rail A′, and receive motion from the central shaft L, as hereinafter described. The weft-thread is withdrawn from the cloth as it is held between the rollers by the reel D, upon which it is wound.

Behind the rollers B are placed a couple of movable blades E, which act in conjunction with the fixed blade F to form shears, which at intervals cut off the exposed ends of warp-threads after the weft has been withdrawn. The movable blades E are carried in brackets *e*, pivoted on studs G, affixed to ears or lugs on the rail A′, being held in position against the fixed shear-blade F by the springs *g*, placed between the boss of the bracket *e* and a washer or collar affixed on the end of the stud G. Each bracket *e* is formed with or has affixed to it a depending arm or lever H, through which it and the blades are moved by means of a catch *h*, fitted thereto, which is at intervals caused to engage with the swinging lever I. The lever I is pivoted on the stud *i*, and is connected to the link K, by which it is caused constantly to swing up and down. The link K receives a reciprocating movement from the disk or crank pin *c*, engaging with the slot *k* therein. The lever I swings clear of the catch *h*, which is pressed or held out of contact with the lever by a small spring—acting like a knife-spring—on its under side, and only engages with the end of the lever I when moved by the collar or washer *m* on the rod M. Either of the knife-blades E may be caused to move down against the fixed blade F by the catch *h* on its arm H being thrown into contact or gear with the swinging lever I. This is done by the movement of the rod M either to left or right, which is operated by the handle N and lever *n*. Thus either blade can be operated at any time by the attendant moving the handle N, which will be done when the weft-thread is clear of the blade. After being depressed or carried down by the swinging lever I the lever H and with it the blade E are returned to the position shown in the drawings by the spring *h′*.

The framing A may be extended to carry the reel D; but in order to render the machine light I at present prefer to provide a separate frame or stand O, upon which the reel is carried by the bracket *o*.

P is a pillar or bracket, with a guide *p*

fitted at the top, through an eye in which the thread passes. This guide is made in the form of a bell-crank lever, fitted with a spring at its other end to keep a slight tension on the thread as it is being wound on the reel. The reel is rotated by means of the bevel-gearing *d*, one wheel on the shaft L and the other on the boss of the reel.

For some classes of material it may be found necessary to assist the weft-thread as it is withdrawn to prevent it becoming entangled with the warp-threads. This may easily be effected by carrying a light roller D′, covered with flannel or some fine card, across the machine and rotated at a slightly-higher speed than the weft-yarn is withdrawn or taken up by the reel, such roller being placed immediately behind the blades or shears E and F. (See Fig. 7.) The weft passing around or over this roller is effectually helped out of the warp, which will largely prevent breakages of the weft-thread.

Counting mechanism is attached to the side of the frame A or other suitable position, and actuated from the shaft L to indicate the length of the weft-yarn withdrawn.

Referring to Figs. 1, 5, and 6, the ratchet-wheel R is moved a given distance at each revolution of the shaft L and reel D by the cam S, actuating it through the levers *r* and *s*. As one end of the lever *s*, which is pivoted at *s′*, is raised by the cam S, the other end is depressed, and by it the end of the lever *r*. Each time the end of the lever *r* is depressed the wheel R is rotated part of a revolution by the pawl *r′*, pivoted to the lever *r*. The wheel R is marked with a scale from 0 up to 120 to indicate the length or number of yards wound on the reel.

T is an index finger or pointer fixed to a bracket on the frame, which acts in conjunction with the scale on wheel R. On the boss of the wheel R is a clutch *u*, which conveys the movement to the train of wheels U, driving the rollers B. The clutch is held in gear by a small spring, so that it can be easily thrown out of gear at any time to return the counting mechanism to zero. The wheel on the shaft of the roller B may be changed to give the feed required according to the number of picks to the inch in the cloth to be tested.

Movement is imparted to the several parts of the apparatus by the hand-wheel L′ on the shaft C. The crank *c* at the end of the shaft C actuates the link K and swinging lever I. A spur-wheel *l′* on the same shaft transfers the motion to the wheel *l* on the shaft L, from which the other parts of the mechanism are operated.

It is evident that this arrangement of mechanism of the several parts of the apparatus may be modified or mechanical equivalents substituted therefor, as the essential features of the invention for withdrawing and winding the weft-yarn and cutting off the exposed ends of the warp-threads may be actuated in any convenient way.

The apparatus operates as follows: The cloth to be tested is introduced between the rollers B, which are slowly rotated by the train of wheels U, and as these rotate the cloth is slowly passed forward. At the same time the end of the weft-thread has been withdrawn from the cloth and carried forward and attached to the reel D, which receives motion from the shaft L through the bevel-wheel *d*. The shear-blades E, working in conjunction with the fixed blade F, are operated at intervals by the link K and lever I to cut off the projecting ends of the warp-thread from which the weft-thread has been withdrawn. When the apparatus is set in motion by the wheel L′, the reel D, winding the weft-yarn upon itself, withdraws it from the edge of the cloth, which is held and slowly passed forward by the rollers B, leaving the ends of the warp-yarns exposed, and these, by the movement of the shear-blades E alternately at intervals, are cut off, so as not to catch or impede the movement of the weft-yarn.

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

1. An apparatus for withdrawing the weft-yarn from woven cloth, having blades or shears with which the ends of the warp-threads are cut away after the weft has been withdrawn, in combination with means for gripping and passing forward the cloth, and a reel by which the weft-thread is withdrawn from the cloth, substantially as described.

2. In an apparatus for withdrawing the weft-yarn from woven cloth, the combination, with rollers which hold and pass forward the cloth, and a reel which receives and withdraws the weft-yarn, of blades or shears which at intervals cut away the exposed ends of the warp-threads, substantially as described.

3. The combination, with the frame A, rail A′, and rollers B, which hold and pass forward the cloth, of the blades or shears E F, which are operated at intervals to cut the warp-threads, and the reel D, which withdraws and receives the weft-yarn, substantially as described.

4. In an apparatus for withdrawing the weft-yarn from woven cloth, the combination, with the frame A, rail A′, and rollers B, of the blades E and F and the reel D, substantially as described.

5. The combination, with the blade E, pivoted bracket *e*, and depending arm or lever H, of the catch *h*, swinging lever I, link K, the crank-pin *c*, and hand-wheel L′, substantially as described.

6. The combination, with the movable blade E, pivoted bracket *e*, depending arm or lever H, and catch *h*, of the rod M, collar *m*, the swinging lever I, link K, and crank-pin *c*, which engages with the slot *k*, substantially as described.

7. The combination, with the blade E, pivoted bracket *e*, arm H, catch *h*, rod M, and

collar *m*, of the swinging lever I, link K, and crank *c*, substantially as and for the purposes described.

8. The combination, with the frame A, rollers B, and blades or shears E and F, of the stand O, bracket *o*, reel D, pillar P, and guide *p*, substantially as described.

9. The combination, with the frame A, rollers B, blades or shears E F, and reel D, of the hand-wheel L′, cog-wheels *l l′*, shaft L, cam S, levers *s r*, counting-wheels R U, index-pointer T, and the actuating-connections for the blades or shears E and the reel D.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MIHRAN MOURADIAN.

Witnesses:

I. OWDEN O'BRIEN,

CHAS. OVERDALE.