No. 652,206. Patented June 19, 1900.

J. W. CLARK.

STOP MOTION FOR LOOMS FOR WEAVING HAIRCLOTH.

(Application filed Nov. 22, 1897.)

(No Model.) 4 Sheets—Sheet 1.

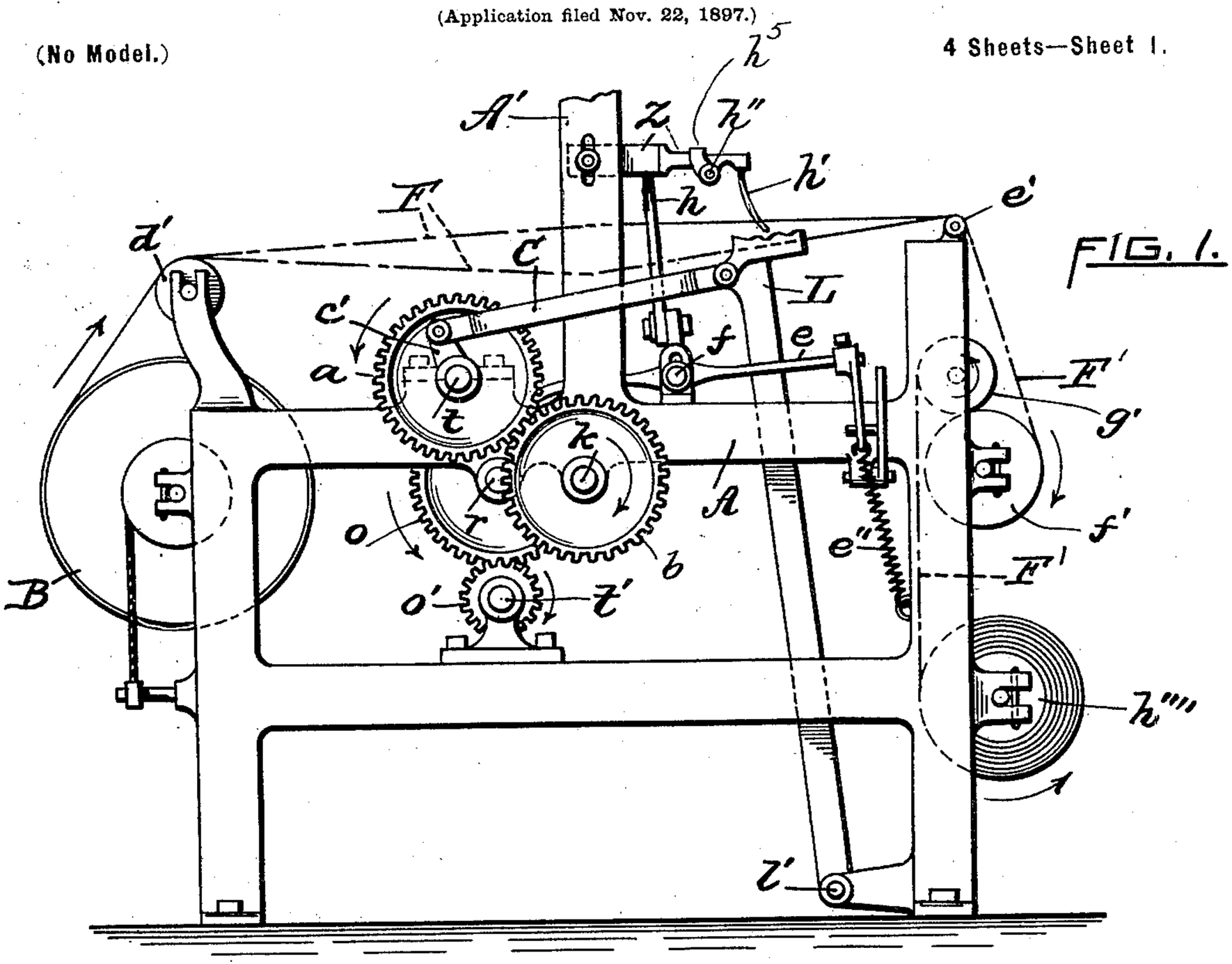

FIG. 1.

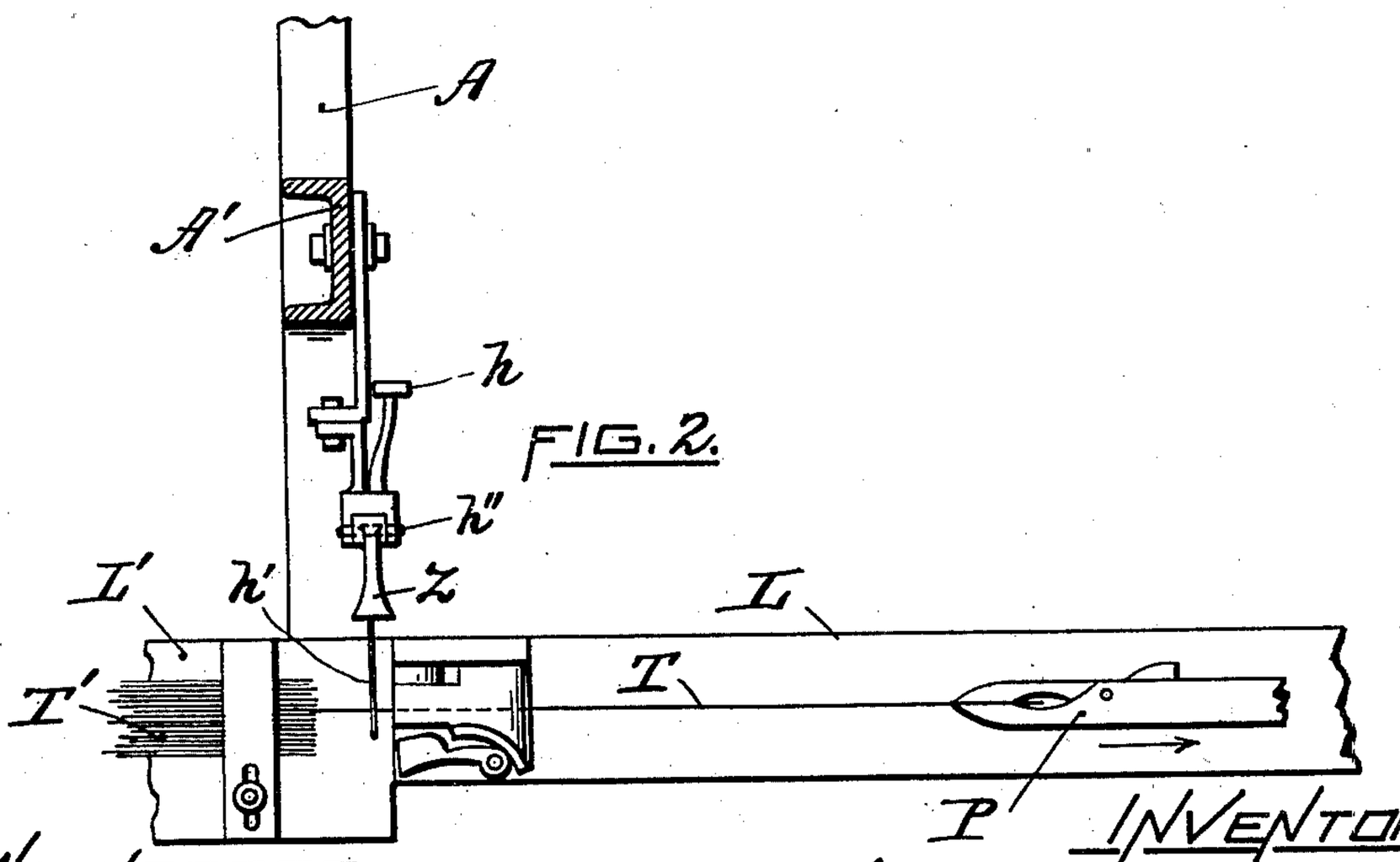

FIG. 2.

WITNESSES.

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FIG. 3.

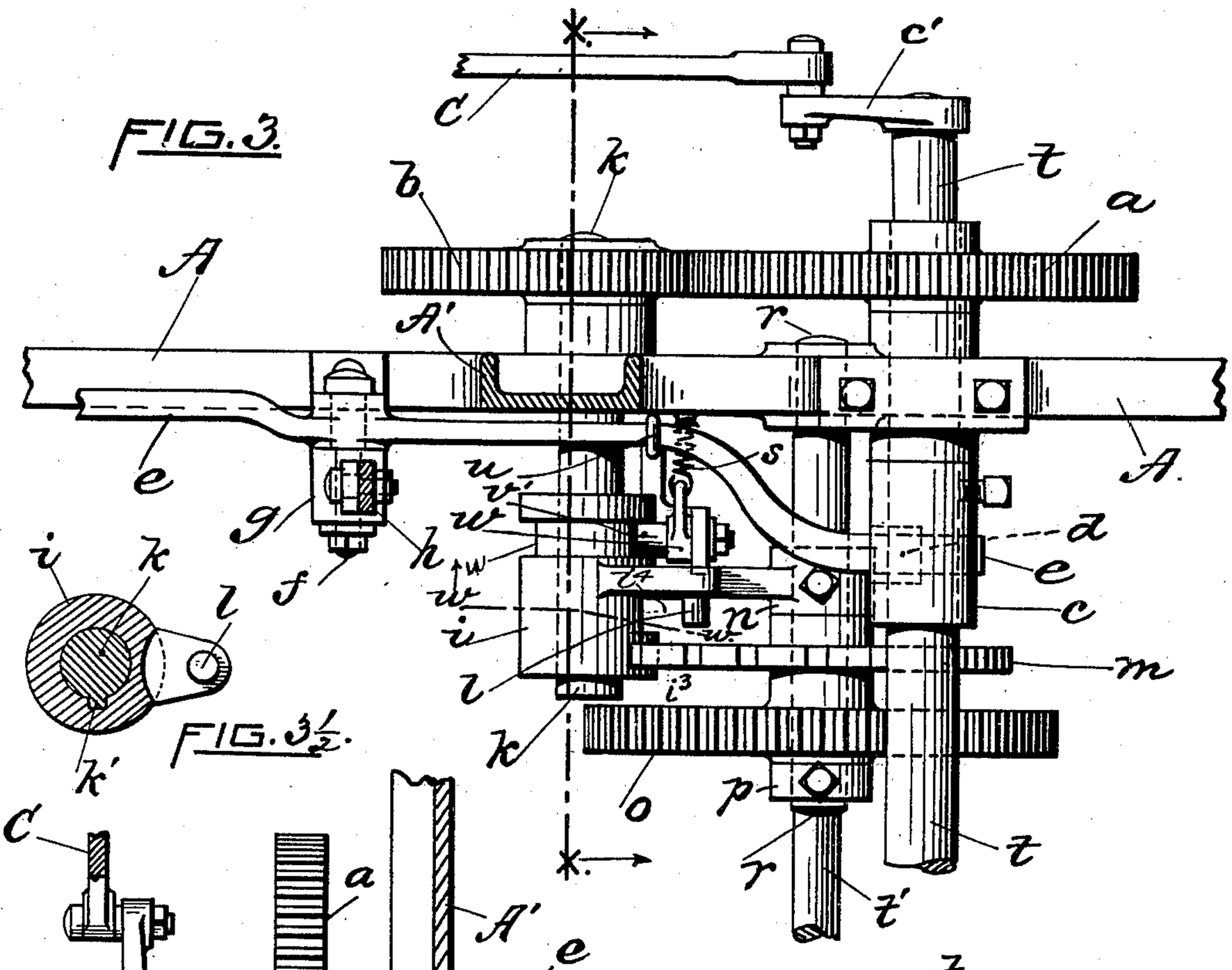

FIG. 3½.

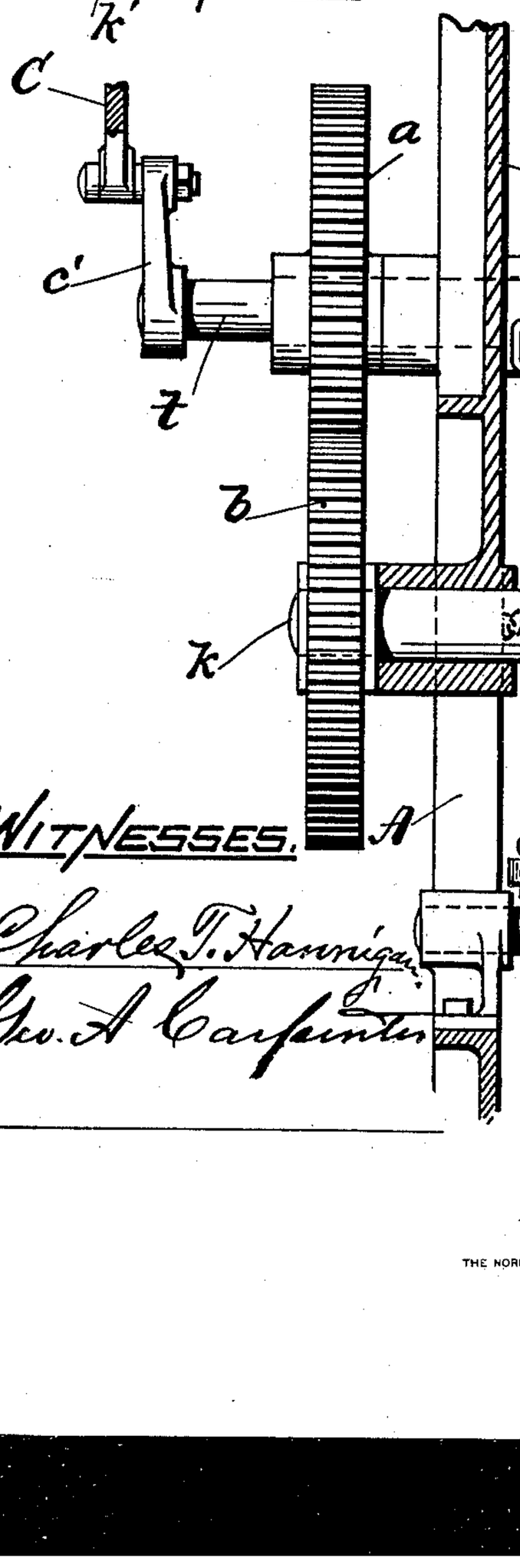

FIG. 4.

WITNESSES.

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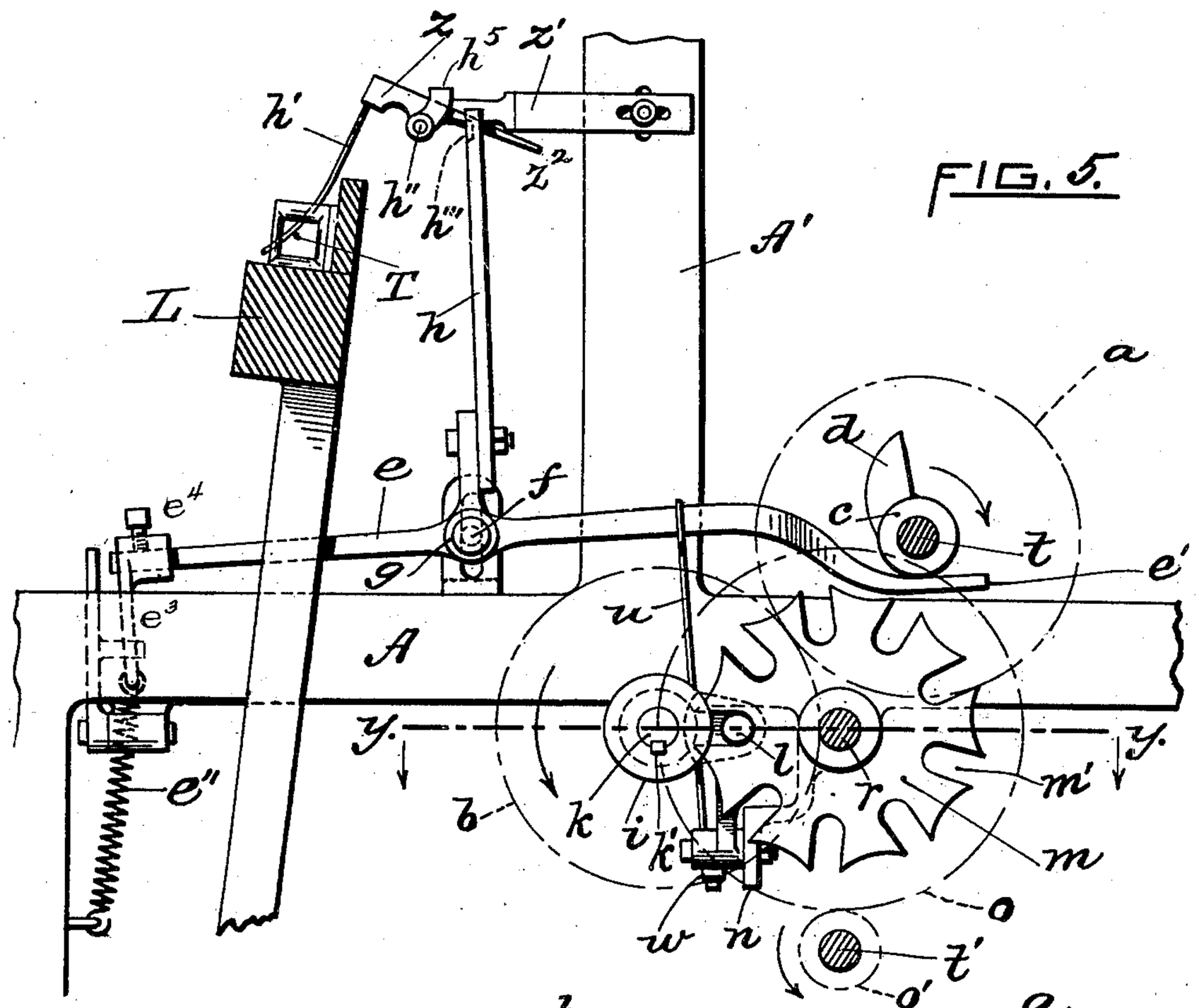

FIG. 5.

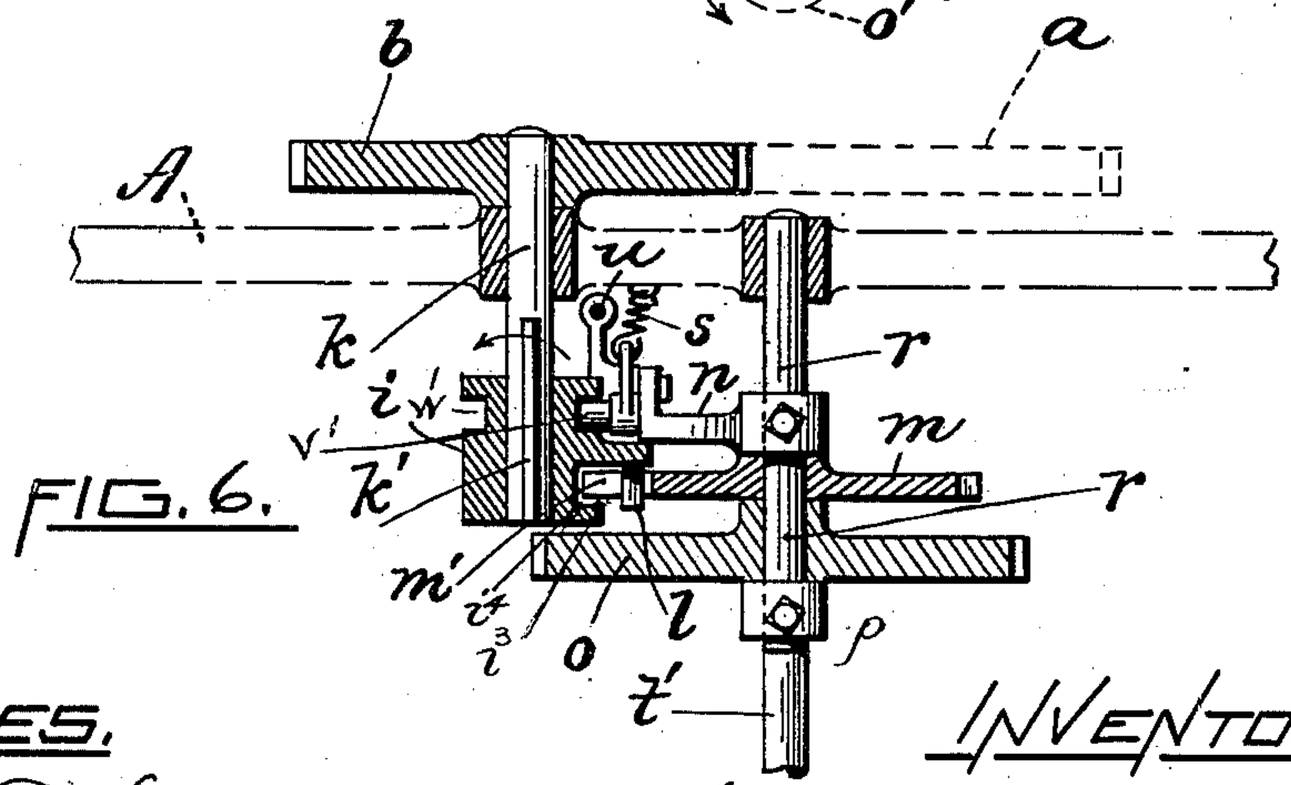

FIG. 6.

WITNESSES.

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(No Model.) 4 Sheets—Sheet 4.

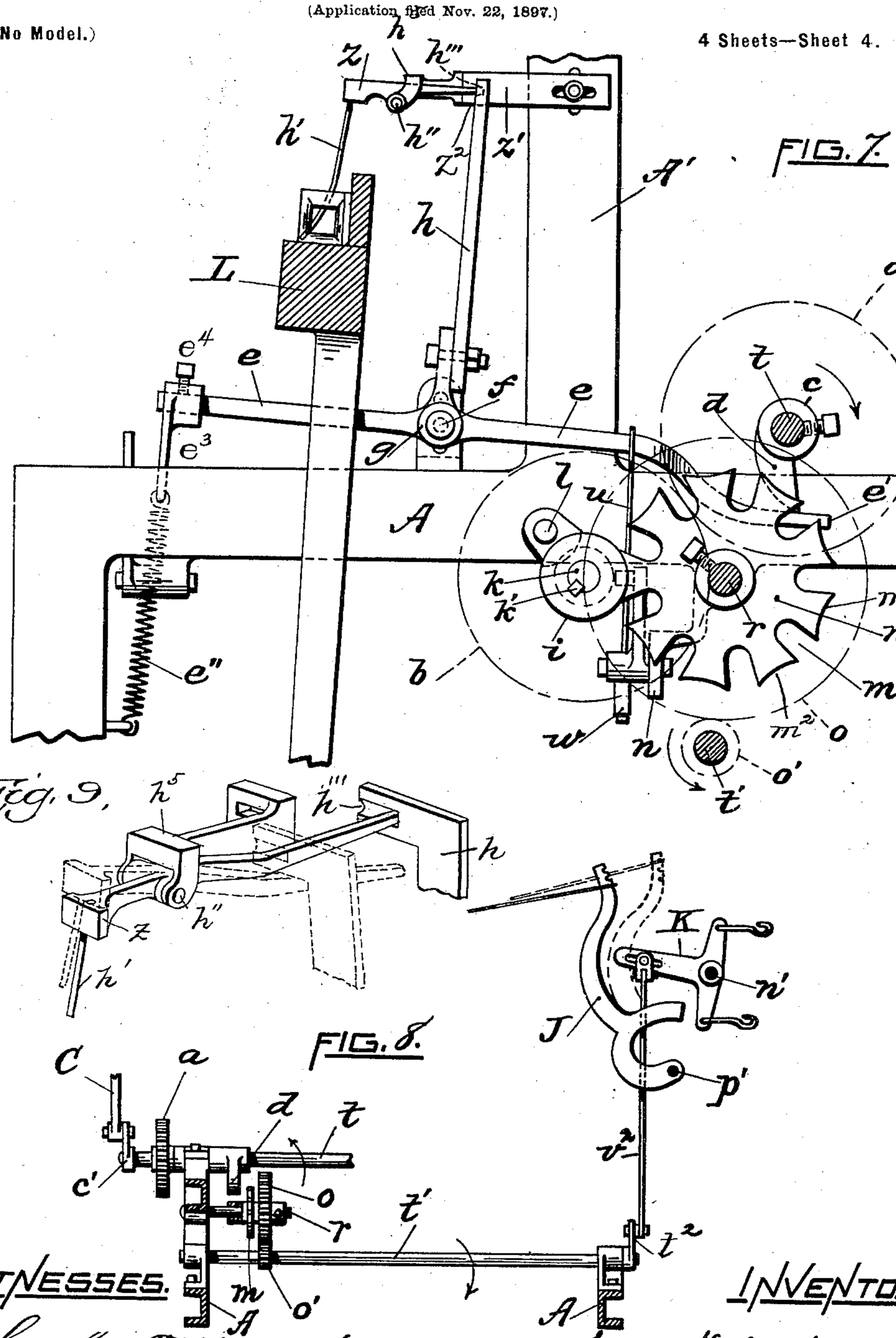

FIG. 7.

FIG. 8.

WITNESSES.

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UNITED STATES PATENT OFFICE.

JAMES WESLEY CLARK, OF PAWTUCKET, RHODE ISLAND, ASSIGNOR OF ONE-HALF TO THE COLLYER MACHINE COMPANY, OF SAME PLACE.

STOP-MOTION FOR LOOMS FOR WEAVING HAIRCLOTH.

SPECIFICATION forming part of Letters Patent No. 652,206, dated June 19, 1900.

Application filed November 22, 1897. Serial No. 659,377. (No model.)

To all whom it may concern:

Be it known that I, JAMES WESLEY CLARK, a citizen of the United States, residing at No. 29 Whipple street, in the city of Pawtucket, in the State of Rhode Island, have invented a certain Stop-Motion for Looms for Weaving Haircloth, of which the following is a specification.

This invention relates to automatic stop-motions for the dobbies of looms wherein the stopping devices are actuated by the breaking of the weft hair or thread.

The said invention consists in the construction and combination of parts hereinafter set forth and claimed and is especially, though not exclusively, intended for haircloth-looms.

In the accompanying drawings, Figure 1 represents an end elevation in the locked position of a loom embodying my invention, the warp-threads and fabric being also shown. Fig. 2 represents a partial top plan view of the lay and proximate parts, the needle being shown drawing the hair. Fig. 3 represents, on an enlarged scale, a top plan view of the stopping mechanism. Fig. 3½ represents a detail view of the sleeve *i* and shaft *k* in cross-section. Fig. 4 represents a front sectional elevation on line *x x* of Fig. 3. Fig. 5 represents a transverse sectional elevation of the loom in normal position, showing the position of the various parts of the stopping mechanism. Fig. 6 represents a horizontal section, looking downward, on line *y y*, Fig. 5. Fig. 7 shows a cross-section of the loom, the stopping mechanism being in the abnormal or locked position. Fig. 8 represents a detail front elevation of the dobby-shaft and the proximate parts operating and operated by the same, the bars of the loom-frame being partly shown in section. Fig. 9 represents a detail perspective view of the lever Z and the arm *h*.

The loom-frame consists of fixed horizontal bars A and vertical bars A′ and supports the driving-shaft *t*, the dobby-shaft *t′*, an intervening secondary rotary shaft *k*, and a fixed parallel proximate shaft *r*. Gear-wheels *a* and *b* transmit motion from driving-shaft *t* to secondary shaft *k*. The shaft *t*, by its crank t^2, operates in the usual way the connecting-rod, and the ordinary T-shaped jacquard-lever K, connected thereto, and the lever J, these two latter parts being pivoted at *n′* and *p′*, respectively. A cog-wheel *o* and notched wheel *m* turn together as one piece on the fixed shaft *r* between a fixed collar *p* and the hub *n* of lever *w*, hereinafter described, the former wheel meshing with a smaller wheel *o′* on the dobby-shaft *t′* to drive the latter, while each of the deep notches or recesses *m′* of wheel *m* is adapted to receive a pin or stud *l*, parallel to shafts *k r*, carried by an arm *i′* of a sleeve *i*, which is provided with a longitudinal interior groove *j*, fitting on a longer rib or spline *k′* of shaft *k*, whereby the said sleeve is allowed a certain amount of longitudinal motion. The said stud, being horizontal, enters from the side any one of the notches *m′* of the vertical wheel *m* as said stud and notch come into juxtaposition. When thus engaged, the sleeve and stud constitute a one-tooth gear-wheel meshing with said wheel *m*. That part of the said sleeve which is just behind the stud *l* is recessed at i^4, so that it will not be in contact with the concave faces m^2 of the said wheel; but that end of the said sleeve which is nearest wheel *o* is left with its full periphery, as shown at i^3, so that when the said sleeve is shifted backward for disengaging the stud *l* the said periphery will be engaged by the next one of the concave surfaces m^2 in order of rotation, and the dobby-shaft will thus not only be ungeared from the main shaft, but will be locked absolutely. This stopping takes place automatically whenever the weft hair or thread is broken or in any way discontinued. To provide therefor, I employ a main shifting lever *e*, an auxiliary shifting lever *w*, directly connected to the said sleeve, and a locking-lever *z*, all three levers being pivoted near their middle points. Levers *e* and *w* are provided with retracting-springs *e″* and *s*, respectively, and are connected together by a rod *u*, so that when the curved power-receiving arm *e′* of lever *e* is depressed the operating-arm *v* of lever *w*, which carries a stud v^2, fitting in a circular groove *w′* of sleeve *i′*, will move said sleeve backward into the position for locking, before described. The end *e′* of lever *e* is acted on by a cam *d* of the main or driving shaft *t*, which, in combination

with the spring e'', maintains normally a continual vibratory movement of the said lever and connections on its fulcrum f. The hub g of the said lever e is sleeved on the said fulcrum and carries a rigid upright arm h, having at its upper end a recess h''', adapted to engage the proximate tapering end z^2 of locking-lever z, which is pivoted at h'' in a bracket h^5 on the end of a longitudinally-adjustable horizontal bar z', supported by one of the upright frame-bars A'. The other end of this locking-lever z is the heavier and has a wire finger h' extending downwardly therefrom, so as to rest obliquely with its slightly-curved lower end on the weft thread or hair T, Figs. 1 and 5, as this is drawn through the shed by the needle P, which is driven by the picker in the usual way. The end z^2 of the lever z is thus held by this weft-thread in a downwardly-inclined position out of engagement with the recess h''', its tapering end z^2 being in a lower horizontal plane than that passing through the said recess, (see Fig. 5,) so that the arm h and lever e, with all connected parts, are free to vibrate.

The lay L is pivoted at l' on an attachment of the lower part of the frame and is oscillated by main shaft t through crank c' and connecting-rod C. The warp-threads F are drawn from cylinder B over guide-roll d' and are acted on to form the shed, Fig. 1, in the usual way. Thence the fabric F' passes over guide-roll e' to, around, and between a pair of pressure-rolls f' g' and is finally wound on cloth cylinder or beam h''''.

The connection of spring e'' is preferably by means of an arm e^3, detachably fastened by screw e^4 to the proximate end of lever e.

The finger h' rests on the weft thread or hair T, as shown in Fig. 5.

The feed-head, Fig. 2, is designated by L' and the weft thread or hair thereon by T'. I do not claim any novelty in these parts nor in the lay or jacquard mechanism, frame, cylinders, dobby-shaft, or driving-shaft, but only in the automatic stopping mechanism herein set forth.

The operation is as follows: While the finger h' is supported by the weft thread or hair T', the combined action of cam d and spring e'' through main shifting lever e, rod u, and auxiliary shifting lever w will maintain a continual reciprocating movement of sleeve i, throwing it alternately into position to turn wheels m o and into position to lock the same. As a result the dobby-shaft is driven with brief intermissions, giving it a step-by-step motion, which is duly transmitted through its crank and lever to the jacquard as the motion proper thereto in operating the harness, (not shown;) but when the weft-hair breaks or for any reason the needle or nipper P does not draw any hair or thread in supporting contact with the finger h' the said finger and the heavy end of lever z descend, giving the said lever a horizontal position, so that the tapering end z^2 of lever z will be ready to enter the recess h''' of arm h, as shown, when the action of cam d on the end e' of lever e, as shown in Fig. 7, throws the arm h back into position for such engagement. While the lay is moving back, the needle or nipper P moves forward at right angles to such motion into the box and is opened, taking a hair from supply of hair T' where this material is kept in suitable separate lengths. As the needle or nipper recedes with the hair thus taken it passes behind the finger h' and is also drawn taut, so that its pressure against the said finger will lift the latter, as well as the lever Z, into the position shown in Fig. 5. If by accident no hair is taken by the needle during the forward movement of the lay, there will of course be no pressure against the said finger and it will remain in the position shown in Fig. 7. It cannot in any case fall farther than this, because, as shown in the last-mentioned figure, the yoke or bracket h^5 passes over the lever Z behind the pivotal point of the latter and serves as a stop. As shown in Fig. 9, the upper end of arm h' is hatchet form, the recess h''' being in the laterally-extended part. When the lever Z is horizontal, as in Figs. 1 and 7, the tail or tapering rear end of the said lever enters this recess, locking the arm h and connected parts. When the said lever is in its normal or tilted position, the said tapering end is below the said recess and in the open space under the laterally-extended part of the arm, so that it will not lock the same. The same action of the said cam, through the connections before stated, moves the sleeve i into locking position, where it remains until a weft thread or wire drawn by the shuttle against the finger h' disengages the end z^2 of lever z from the recess h^3 and leaves the mechanism ready for normal operation again.

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

1. In a loom, the combination with a dobby-shaft and a gear-wheel o' fast thereon, of wheels m and o having their axial line parallel with the said dobby-shaft and turning together, the said wheels o, o', intermeshing, and the said wheel m being provided with notches m' and alternating concave surfaces m^2, a sleeve provided with means for interlocking with said surfaces, or entering said notches for rotation, according to the longitudinal position of the said sleeve, a shaft on which the said sleeve is feathered, a shifting lever and intervening connections for reciprocating the said sleeve longitudinally, automatic mechanism for vibrating the said shifting lever and a movable device which is supported on the weft-thread and adapted to drop into position to lock the said shifting lever on the breaking or failure of the thread, substantially as set forth.

2. In combination with the dobby-shaft of a loom and a gear-wheel o' fast on the said

shaft, a cog-wheel *o* and notched wheel *m* arranged with their axial lines parallel to the said shaft and turning together, the wheels *o* and *o'* intermeshing and the wheel *o* being provided with peripheral notches *m'* and alternating concave surfaces, a rotary shaft *k* parallel to the shaft-bearing wheels *m* and *o*, a longitudinally-movable sleeve feathered on shaft *k* and carrying a pin or stud *l* adapted to enter any one of the said notches, the periphery of the said sleeve being formed to engage one of the said concave surfaces when shifted for removing the said pin from such engagement, a lever *w* provided with a stud which engages with said sleeve, an auxiliary lever *e*, means for making connection between these levers to shift the said sleeve, an arm which moves with the said lever *e*, a movable device arranged to be supported by the weft-thread and engaging the said arm to lock the said shifting lever when the weft-thread breaks or is missing, substantially as set forth.

3. In combination with the dobby-shaft of the loom and gearing for driving the same including a wheel *m* having peripheral notches and locking-surfaces arranged alternately, a movable device provided with means for engaging either a recess or locking-surface of said wheel according to position, a shifting lever acting on the said movable device, a locking device arranged to drop into engagement with the said shifting lever, on a weft-hair breaking or missing, and mechanism for oscillating the said shifting lever, the action of such lever on the said movable device at once ungearing and locking the said dobby-shaft, and the said locking device which engages the said shifting lever serving to hold it in position to maintain such disengagement and locking, substantially as set forth.

JAMES WESLEY CLARK.

Witnesses:
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GEO. A. CARPENTER.