

(No Model.)

3 Sheets—Sheet 1.

M. V. PALMER.  
STOP MOTION FOR WINDING SPINDLES.

No. 564,218.

Patented July 21, 1896.

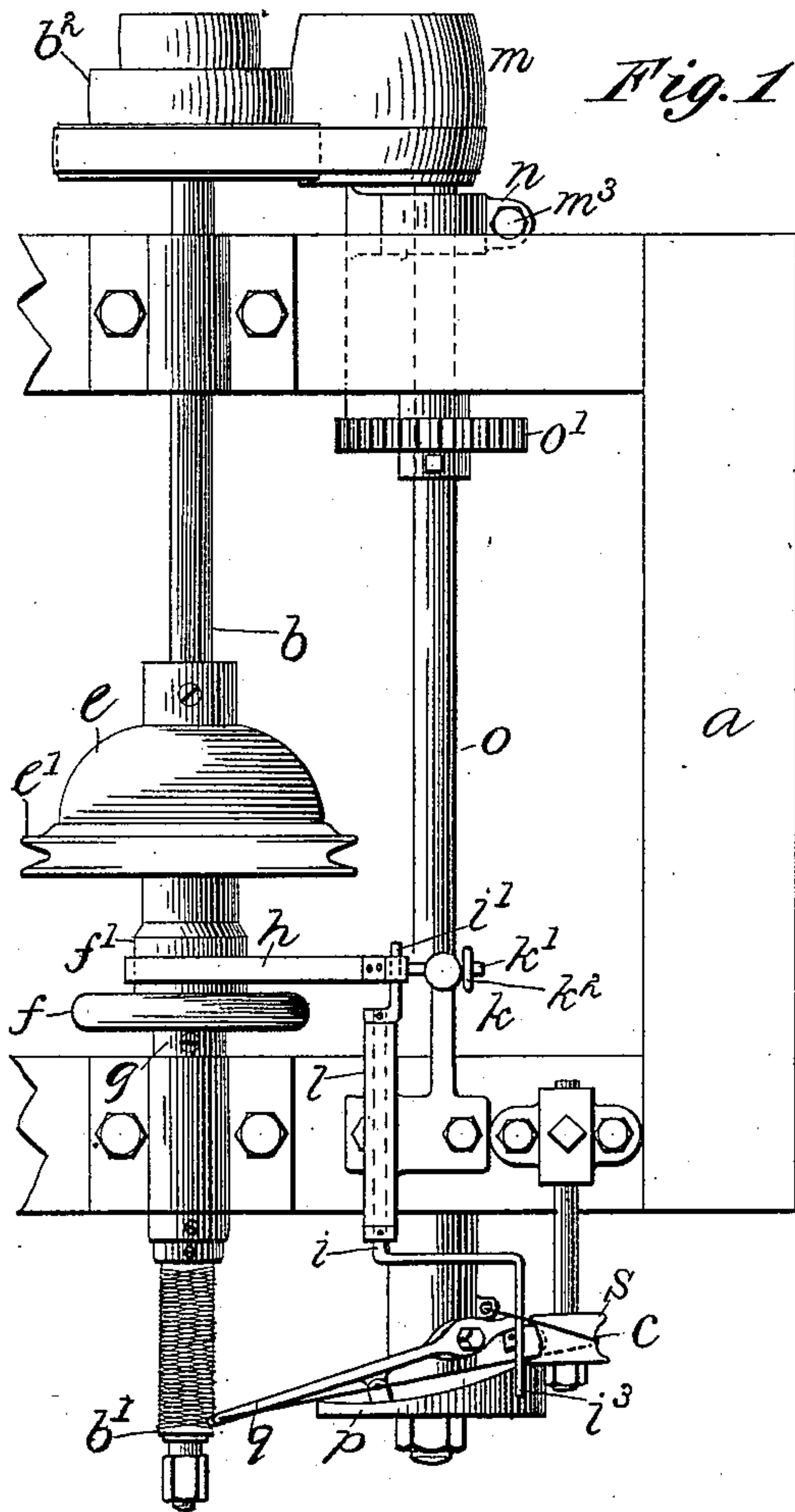


Fig. 1

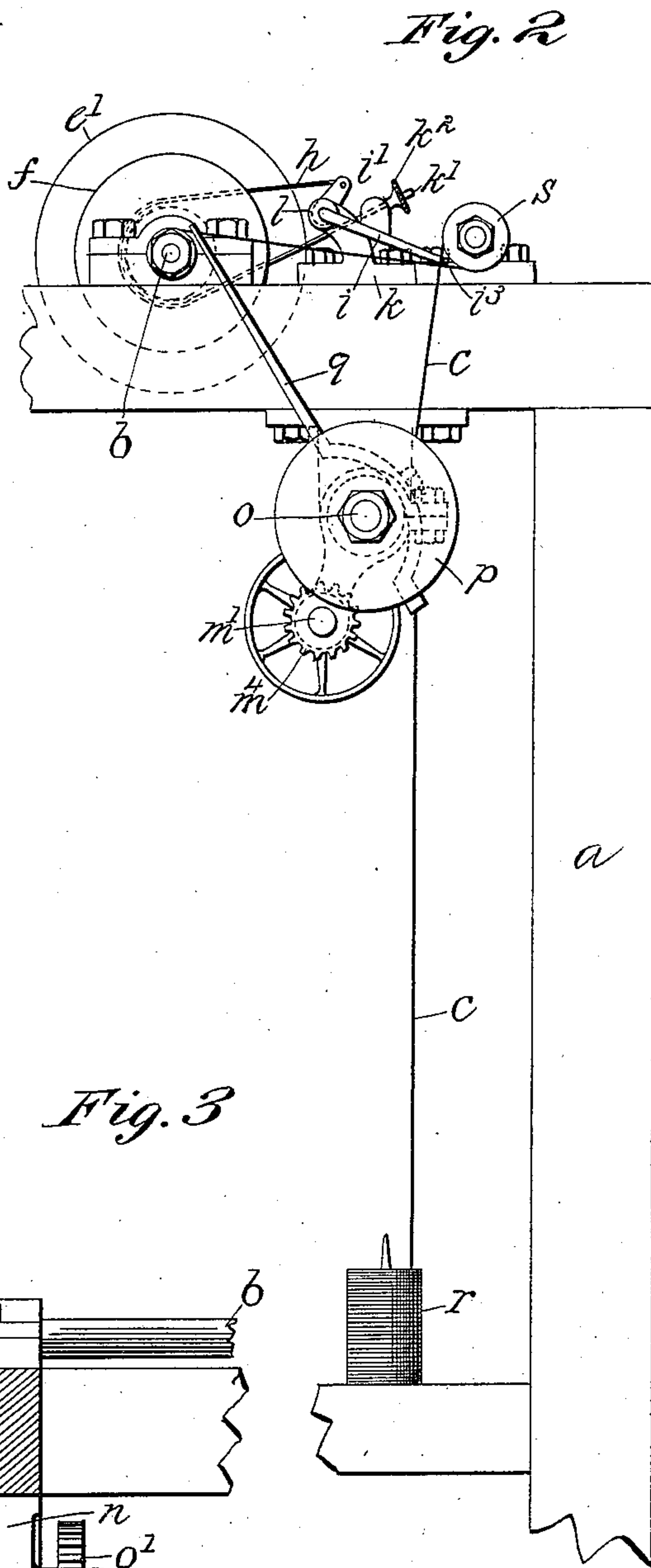


Fig. 2

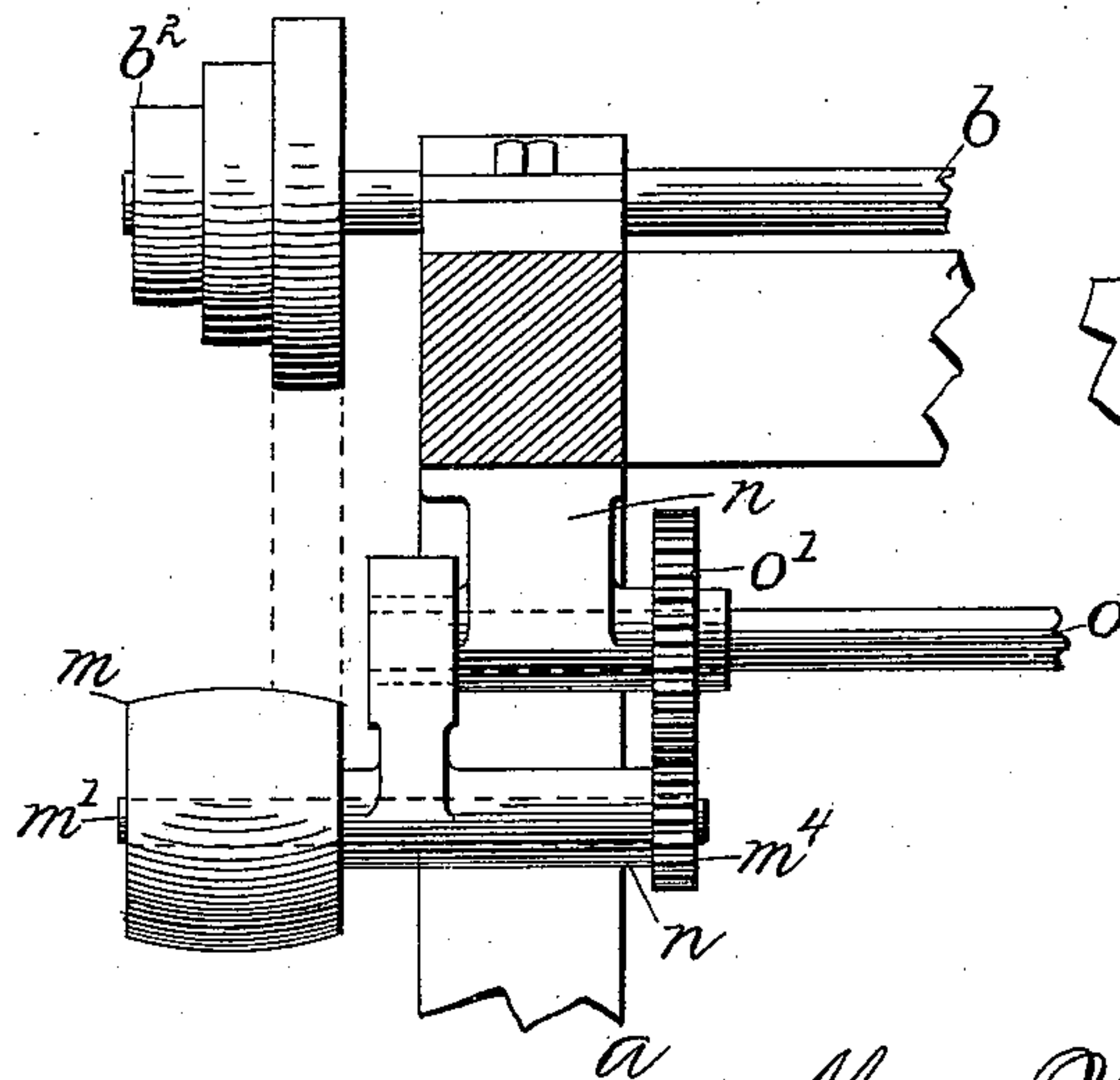


Fig. 3

Witnesses

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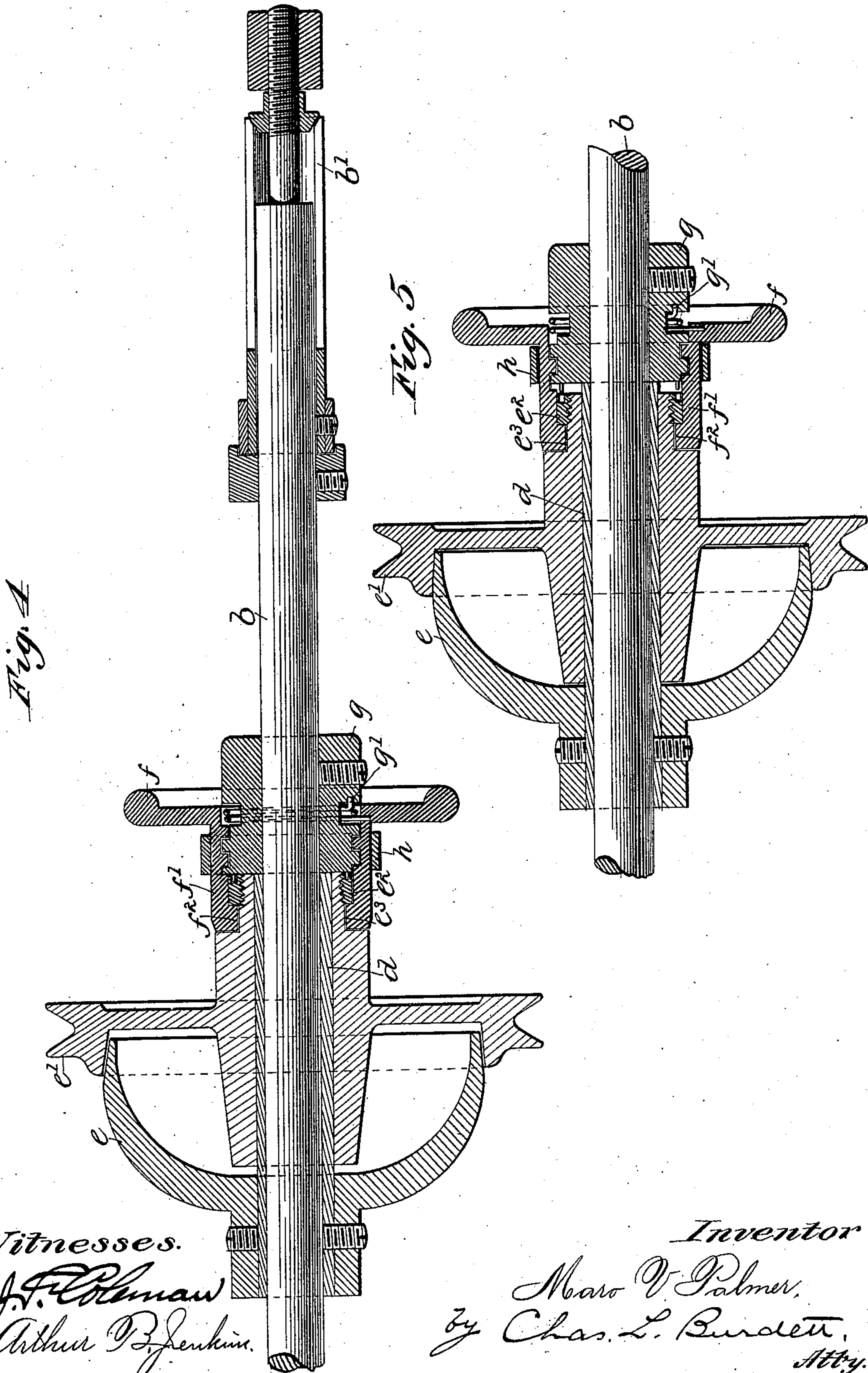
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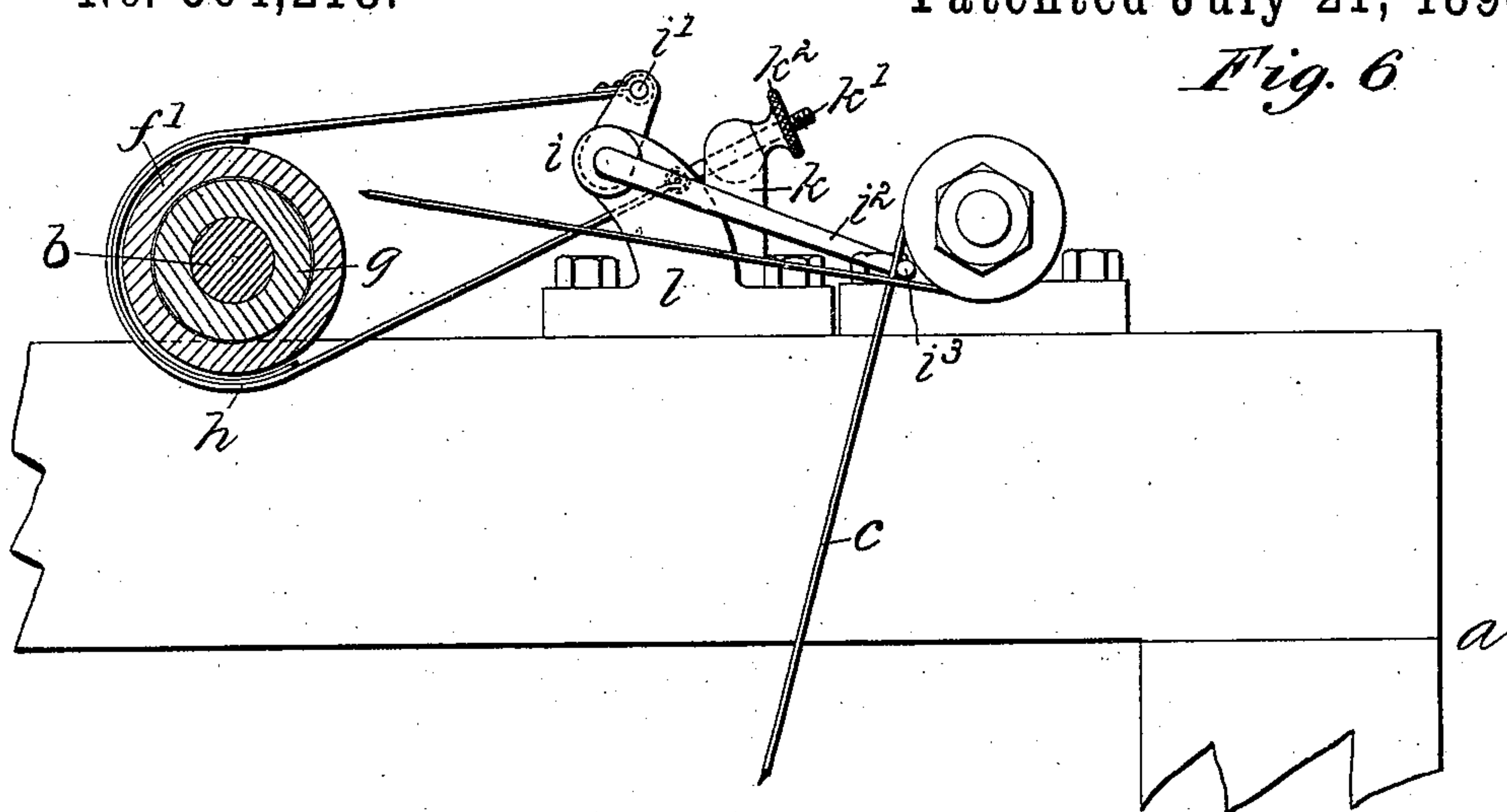


Fig. 6

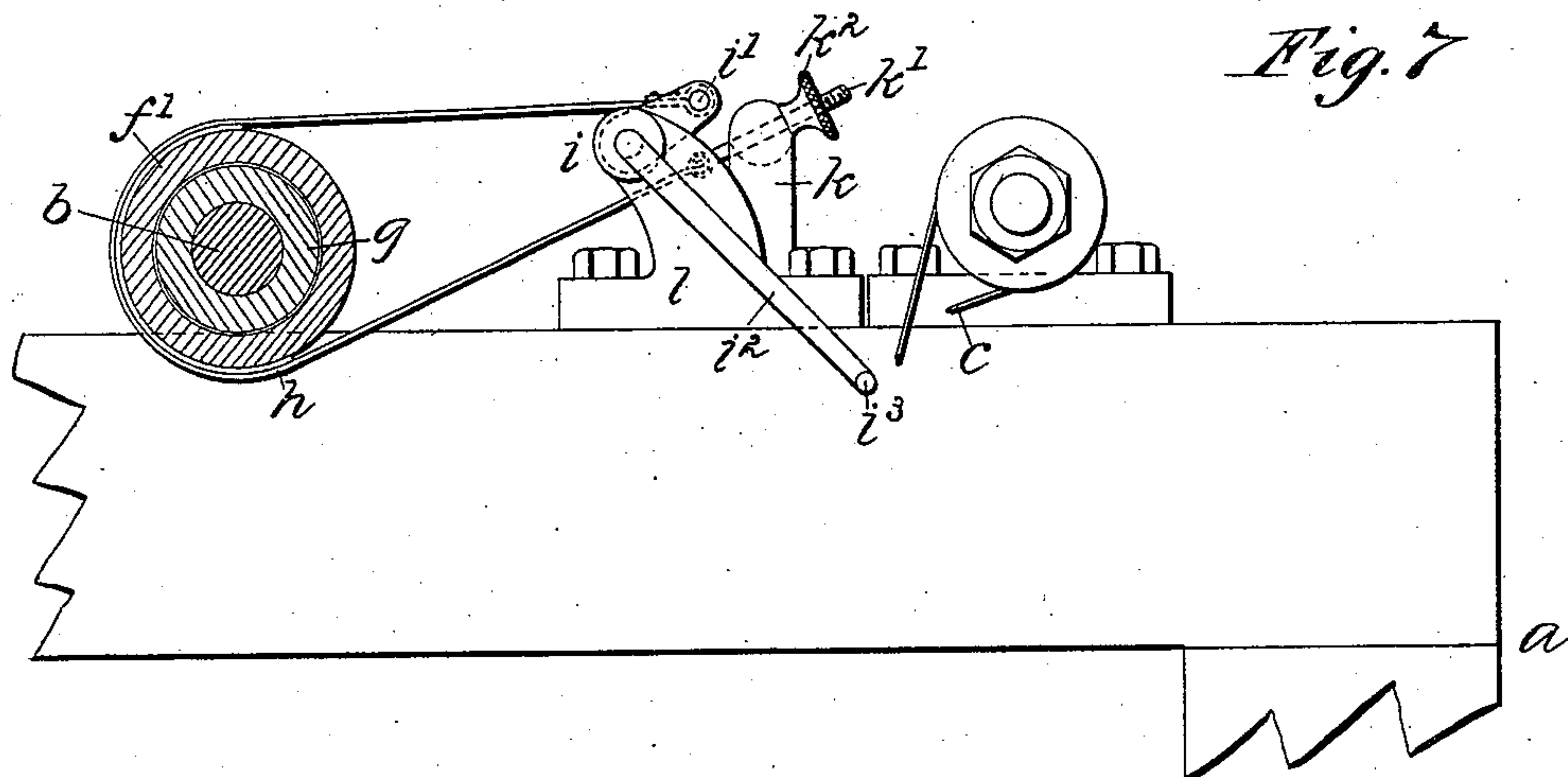


Fig. 7

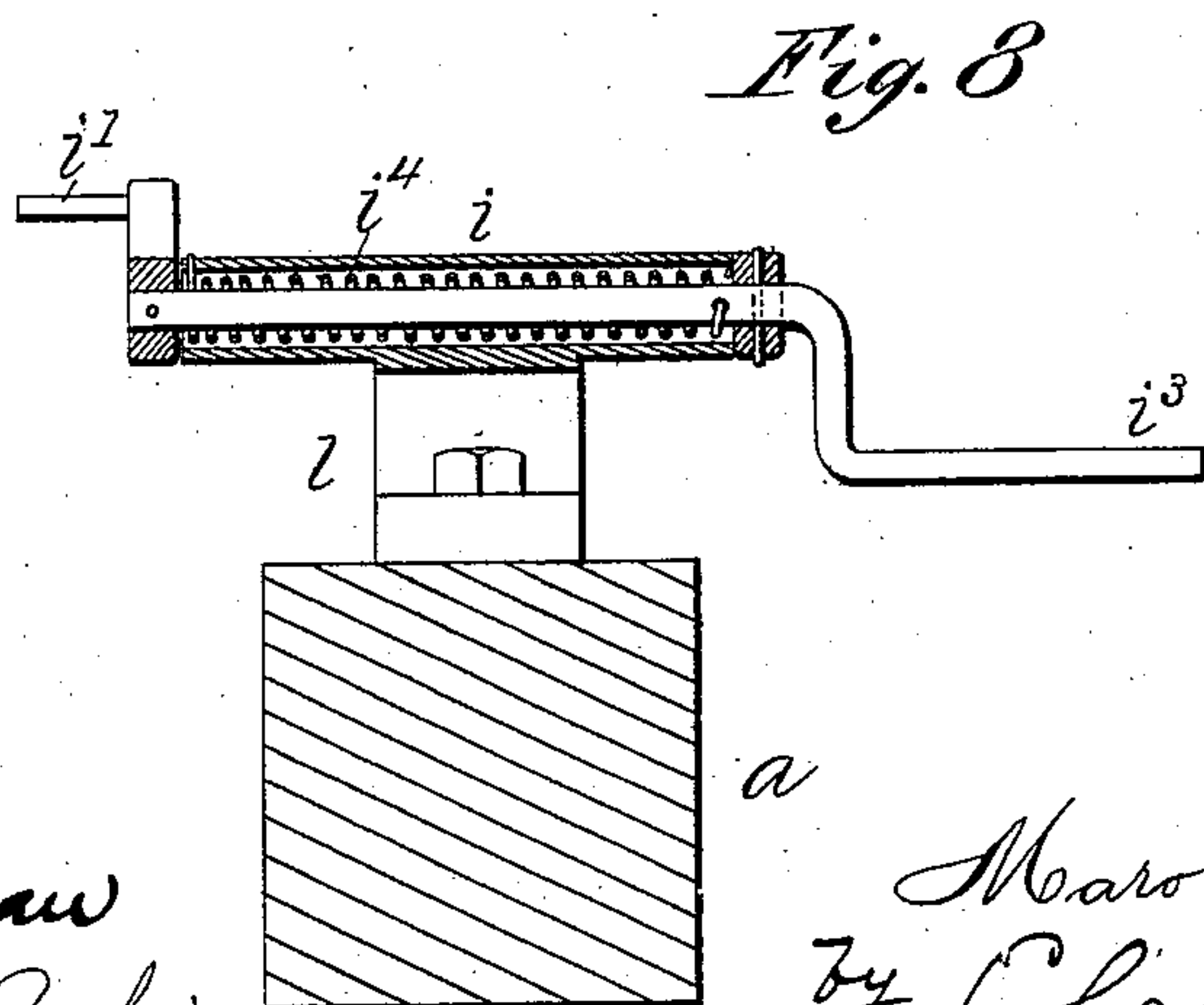


Fig. 8

Witnesses.

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# UNITED STATES PATENT OFFICE.

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## STOP-MOTION FOR WINDING-SPINDLES.

SPECIFICATION forming part of Letters Patent No. 564,218, dated July 21, 1896.

Application filed September 23, 1895. Serial No. 563,306. (No model.)

*To all whom it may concern:*

Be it known that I, MARO V. PALMER, a citizen of the United States, and a resident of Willimantic, in the county of Windham and State of Connecticut, have invented certain new and useful Improvements in Stop-Motions for Winding-Spindles, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

The object of my invention is to provide a machine for winding thread into a cop, bobbin, or other mass with means for controlling automatically the winding operation; and my invention consists in details of the several devices making up the winding and the clutch parts and connections and the combinations of such parts, as more particularly hereinafter described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a top or plan view of part of a winding-frame, showing one spindle. Fig. 2 is a detail view, in side elevation, of a winding-frame, showing my improved winding mechanism. Fig. 3 is a detail end view, in vertical section, through part of a winding-frame, showing the adjustable pulley. Fig. 4 is a view in longitudinal section of the spindle, showing the clutch parts disengaged and on enlarged scale. Fig. 5 is a detail view, in longitudinal section, of a portion of the spindle, showing the clutch parts in engagement and on enlarged scale. Fig. 6 is a side view of a portion of the frame of the machine, showing the stop mechanism on enlarged scale and in position to cause the clutch parts to be engaged. Fig. 7 is a like view showing the stop mechanism in position to disengage the clutch parts. Fig. 8 is a detail view showing a modification of the bent lever.

In the accompanying drawings a part of a winding-frame and one winding-spindle and its connected parts are shown as embodying all that is required for a full understanding of the nature and extent of my improvement.

The letter *a* denotes a frame or table arranged to support one or more winding-spindles *b* and the spindle-driving mechanism. The spindle *b* is mounted in suitable bear-

ings on the frame of the machine, and bears on its outer end an expansible tip *b'*, around which the thread *c* is wound to form a cop or bobbin. The construction of this tip and its manner of attachment to the spindle may be after any of the well-known forms, and as it forms no part of the invention a detailed description herein is deemed unnecessary.

A sleeve *d* is secured to the spindle *b* and a driven section *e* of a clutch device is secured to this sleeve. This driven section *e* is preferably formed to bell shape, as shown in the drawings, the edge of which is slightly beveled and lies within the flange of the driving-section *e'* of the clutch device. The inner surface of the flange of this driving-section is beveled to fit the beveled surface of the driven section, and the outer surface of the driving-section is grooved or otherwise suitably formed to receive a belt or like part for rotating the clutch parts.

A collar *e<sup>2</sup>* is secured to a hub of the driving-section *e'*, forming a groove *e<sup>3</sup>*, in which is located a flange *f<sup>2</sup>*, formed on the inner surface of a hollow hub or sleeve *f'* of a hand-wheel *f*. The inner surface of the hub of this hand-wheel is threaded, as shown in Figs. 4 and 5 of the drawings, this thread fitting the thread on a spindle-collar *g*, secured to the spindle *b*. A spring *g'* is located in an annular recess in the spindle-collar *g*, one end of the spring being secured to said collar and the other end to the hand-wheel *f*, the tendency of the spring being to rotate the hand-wheel on the spindle-collar, which rotation causes said hand-wheel to be moved toward the clutch device, the end of the hub or sleeve *f'* thrusting against a shoulder on the driving-section *e'*. This forces the two sections of the clutch device into engagement and causes the spindle to be rotated with the driving-section *e'*.

Around the hub *f'* of the hand-wheel *f* passes a band-brake *h*, one end of which is secured to an arm *i'* of a bent lever *i* and the other end to a band-brake bracket *k*, mounted on the frame of the machine. The brake is secured to one end of a rod *k'*, that passes through the bracket, the opposite end of the rod bearing an adjusting-nut *k<sup>2</sup>*, by means of which the rod may be moved in the bracket



and thus provide an adjustment for the tension of the band-brake on the hub of the hand-wheel *f*.

The bent lever *i* is rotatively mounted in a lever-bracket *l*, secured to the frame of the machine, and the end *i*<sup>3</sup> of the arm *i*<sup>2</sup> of this lever is so formed as to engage the thread *c* when the parts are in position for winding a bobbin. This bent lever forms a sort of bell-crank lever, one end of which is secured to the band-brake *h* and the other end adapted to rest in contact with the thread of which the bobbin is being formed. The arm *i*<sup>2</sup> of this bent lever may be of such a weight as to cause the band-brake *h* to bind with sufficient force upon the hub *f*' of the pulley *f*, or a spring *i*<sup>4</sup> (see Fig. 8 of the drawings) may be used for this purpose.

To the opposite end of the spindle *b* from the tip *b*' is secured a cone-pulley *b*<sup>2</sup>, a belt passing around this pulley and around an equalizing-pulley *m*. This equalizing-pulley *m* is secured to an equalizing-shaft *m*', mounted in an equalizing-bearing *m*<sup>2</sup>, adjustably secured to a support *n*, fastened to the frame of the machine. The equalizing-bearing *m*<sup>2</sup> is mounted on a hub of the support *n* and concentric with the axis of the cam-shaft *o*, one end of which is mounted in the bracket *n* and the other in a suitable bearing on the opposite side of the frame of the machine. This equalizing-bearing *m*<sup>2</sup> is divided, as shown in dotted outline in Fig. 2 of the drawings, nuts *m*<sup>3</sup> being used for clamping the bearing to the hub of the support in any desired position. The object of this equalizing-bracket is for the purpose of allowing the belt to be used on any of the different faces of the cone-pulley for the purpose of varying the speed at which the cam-shaft *o* shall be rotated. A pinion *m*<sup>4</sup> is secured to the equalizing-shaft *m*' and is in mesh with a gear *o*', secured to the cam-shaft *o*.

The opposite end of the cam shaft bears a cam *p*, and a traverser *q* is pivoted in operative relation to the cam, the traverser having a bearing on the face of the cam at two points located on opposite sides of the pivot of said traverser. The opposite end of the traverser is suitably formed to receive the thread *c* and guide it back and forth along the bobbin being formed on the machine, the traverser also having a movement toward and from the bobbin. This construction of traverser and cam is of a well-known construction, forms no part of the present invention, and a further and detailed description of the same is deemed unnecessary herein.

The operation of the device is as follows:  
The thread *c* passes upward from the spool *r*

in front of an idler *s*, around the idler to the under side, and thence onto the bobbin being formed on the spindle *b*. The end *i*<sup>3</sup> of the arm *i*<sup>2</sup> of the bent lever *i* is located between the loop thus formed and the periphery of the idler *s*, as clearly shown in Fig. 2 of the drawings, this end of the lever resting upon that part of the thread located between the idler *s* and the bobbin. Upon the breaking of the thread *c* this end *i*<sup>3</sup> of the arm is freed from engagement with the thread and drops downward, throwing the opposite end of the bent lever over and tightening the band-brake *h* upon the hub *f*' of the hand-wheel *f*. The impediment thus formed to the rotation of the hand-wheel *f* causes it to travel along the thread on the spindle-collar *g*, carrying with it the driving-section *e*' of the clutch device, thus separating the two clutch-sections and stopping the rotation of the spindle *b*.

The clutch as such is operative to perform its function without regard to the special purpose for which the spindle or shaft is driven, and may be used in connection with other mechanism than winding machinery.

I claim as my invention—

1. In a thread-winding apparatus, the combination of a winding-spindle having a screw-threaded portion, *g*, a clutch-section *e* carried by the spindle, another clutch-section *e*' loose upon the spindle, a rotatable hub or sleeve *f*' having a screw-threaded portion which engages with the screw-threaded part of the spindle, and which is in engagement with and operates the clutch, a band-brake which surrounds the said hub or sleeve, and a lever connected at one end to the said brake, and its opposite end being in engagement with the thread being wound so as to operate whenever the thread is slackened, substantially as set forth.

2. In a thread-winding apparatus, the combination of a winding-spindle having a screw-threaded portion, a clutch device carried by the spindle, a threaded rotatable hub or sleeve engaging with the threaded portion of the spindle and adapted to operate the clutch, a coiled spring *g*' connected at one end with the said hub or sleeve and tending to turn it so as to cause engagement of the clutch parts, a brake which operates upon the said hub or sleeve and brake-operating mechanism adapted to be operated upon the slackening of the thread being wound, substantially as set forth.

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Witnesses:

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