

No. 636,493.

Patented Nov. 7, 1899.

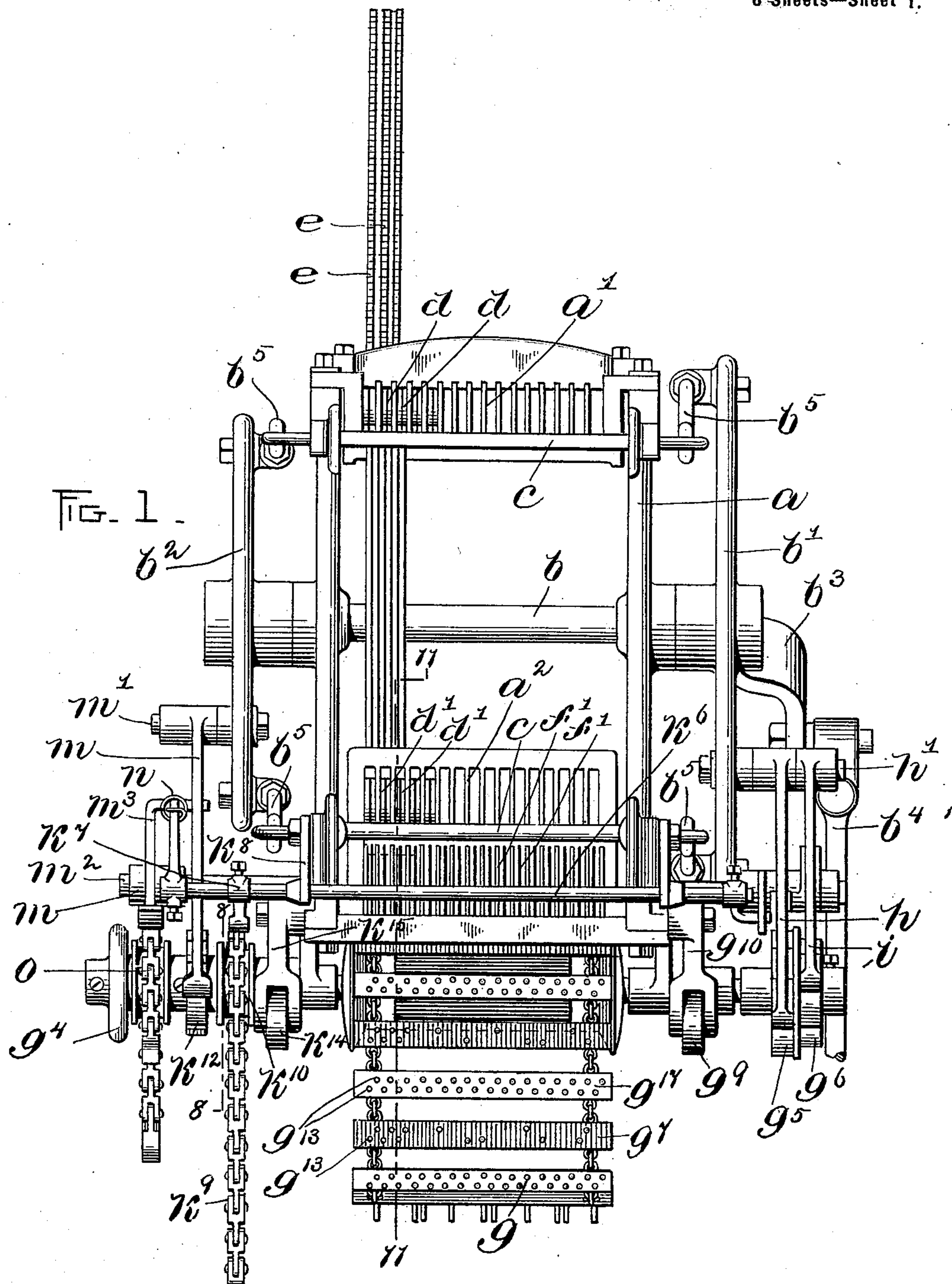
R. H. COOK.

SHEDDING MECHANISM FOR LOOMS.

(Application filed Oct. 29, 1898.)

(No Model.)

6 Sheets—Sheet 1.



WITNESSES:
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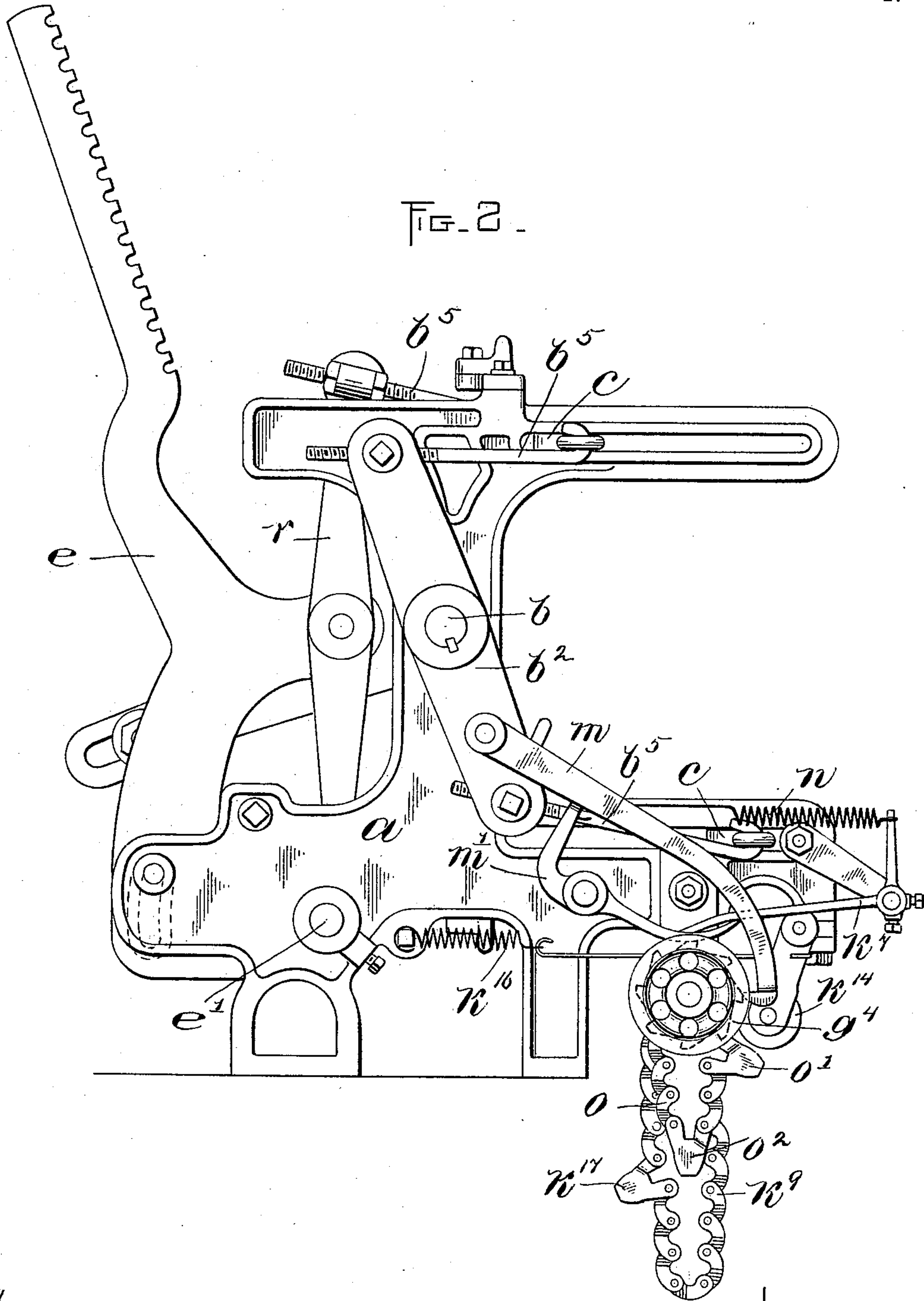
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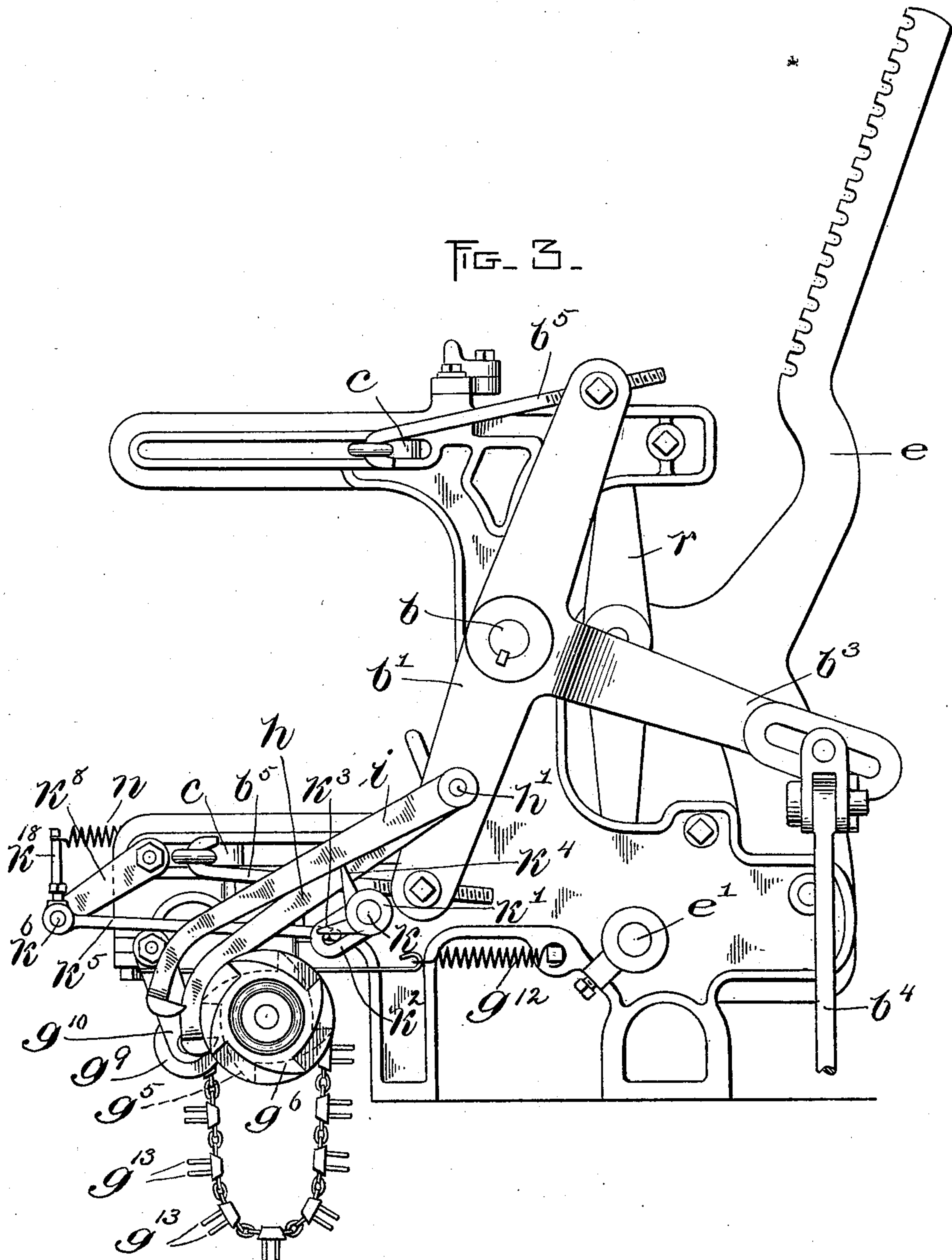
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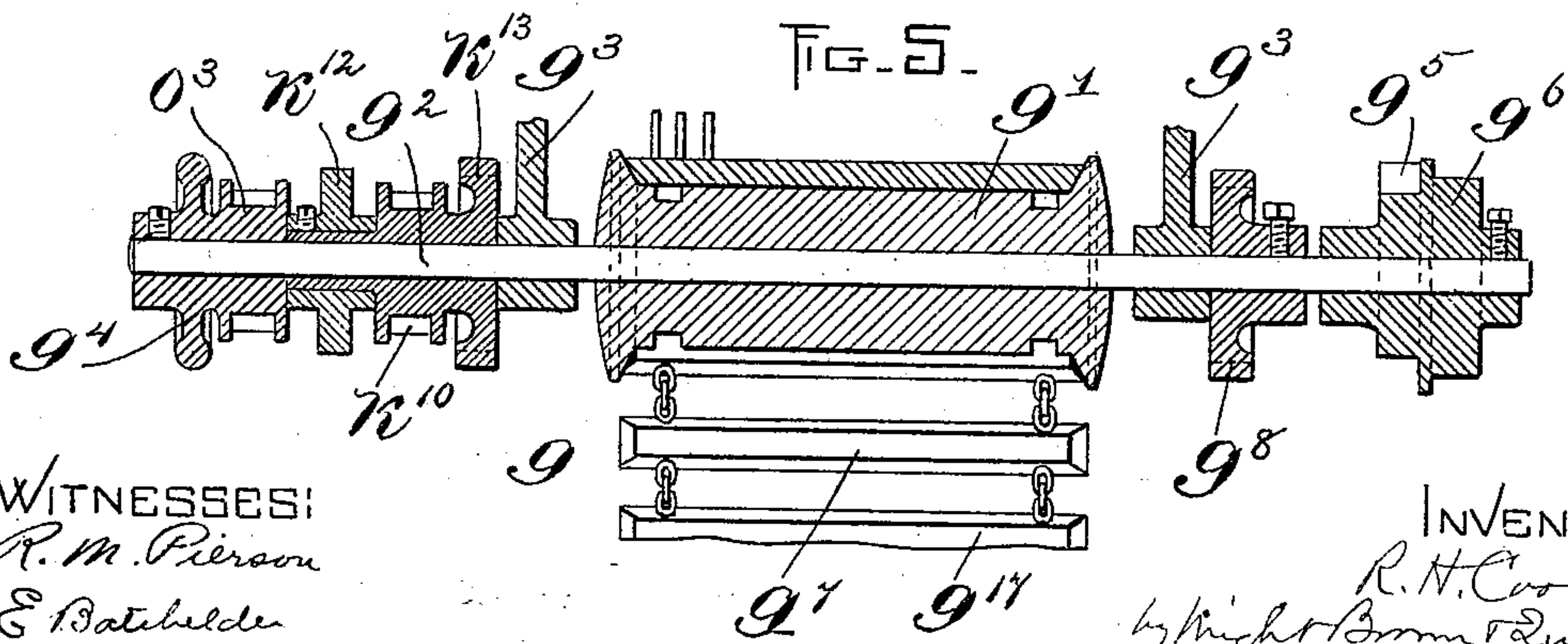
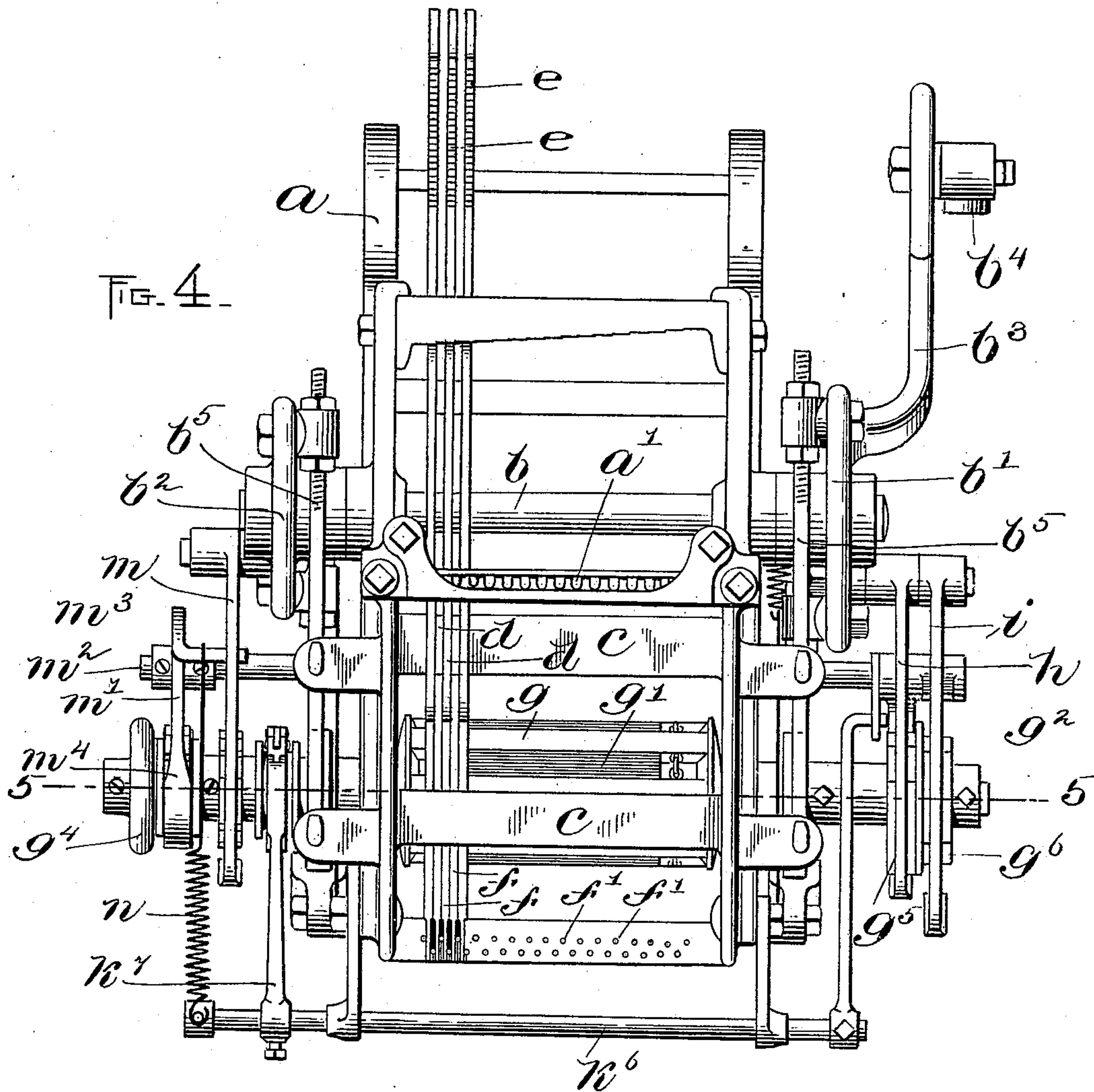
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(Application filed Oct. 29, 1898.)

6 Sheets—Sheet 4.



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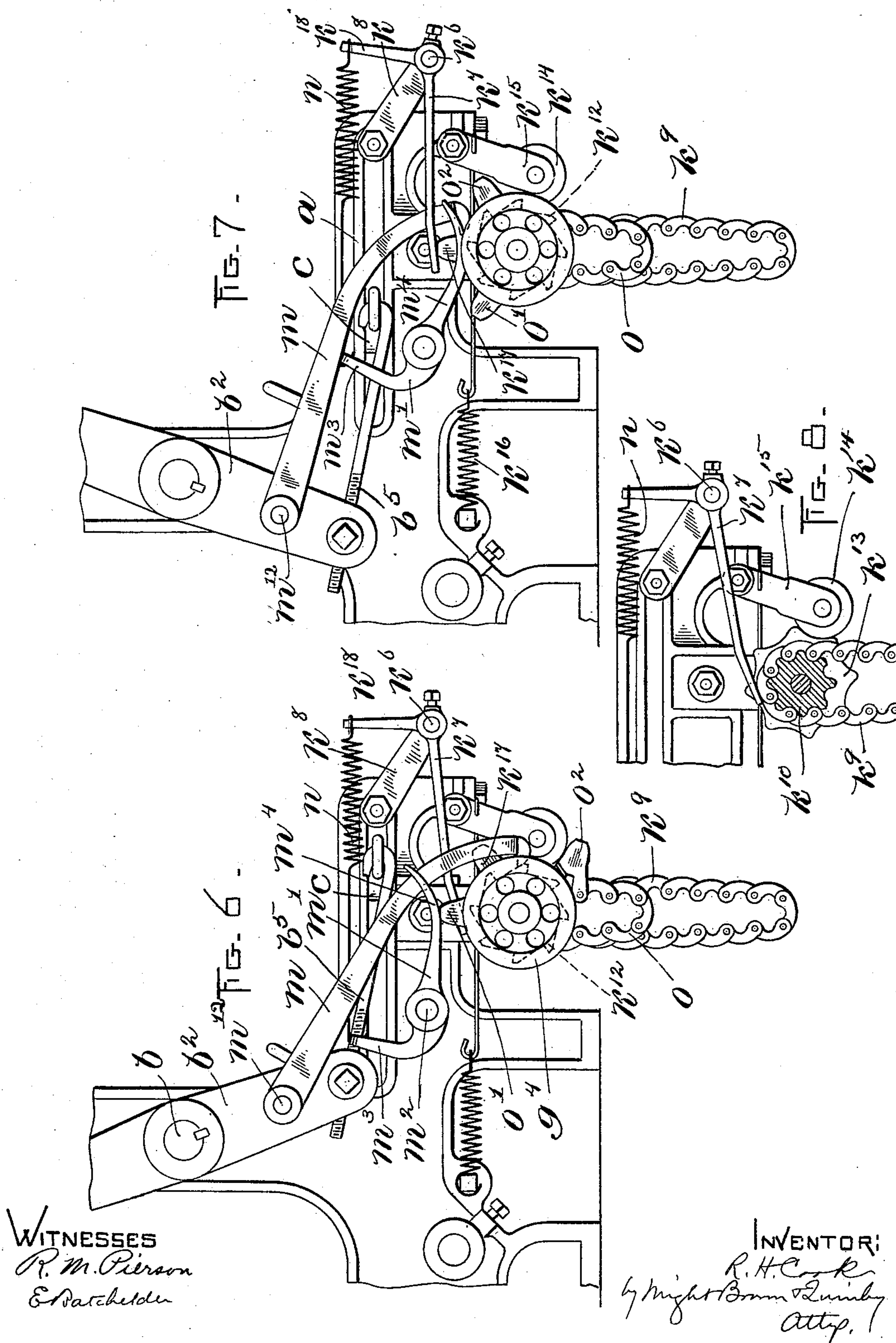
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6 Sheets—Sheet 5.



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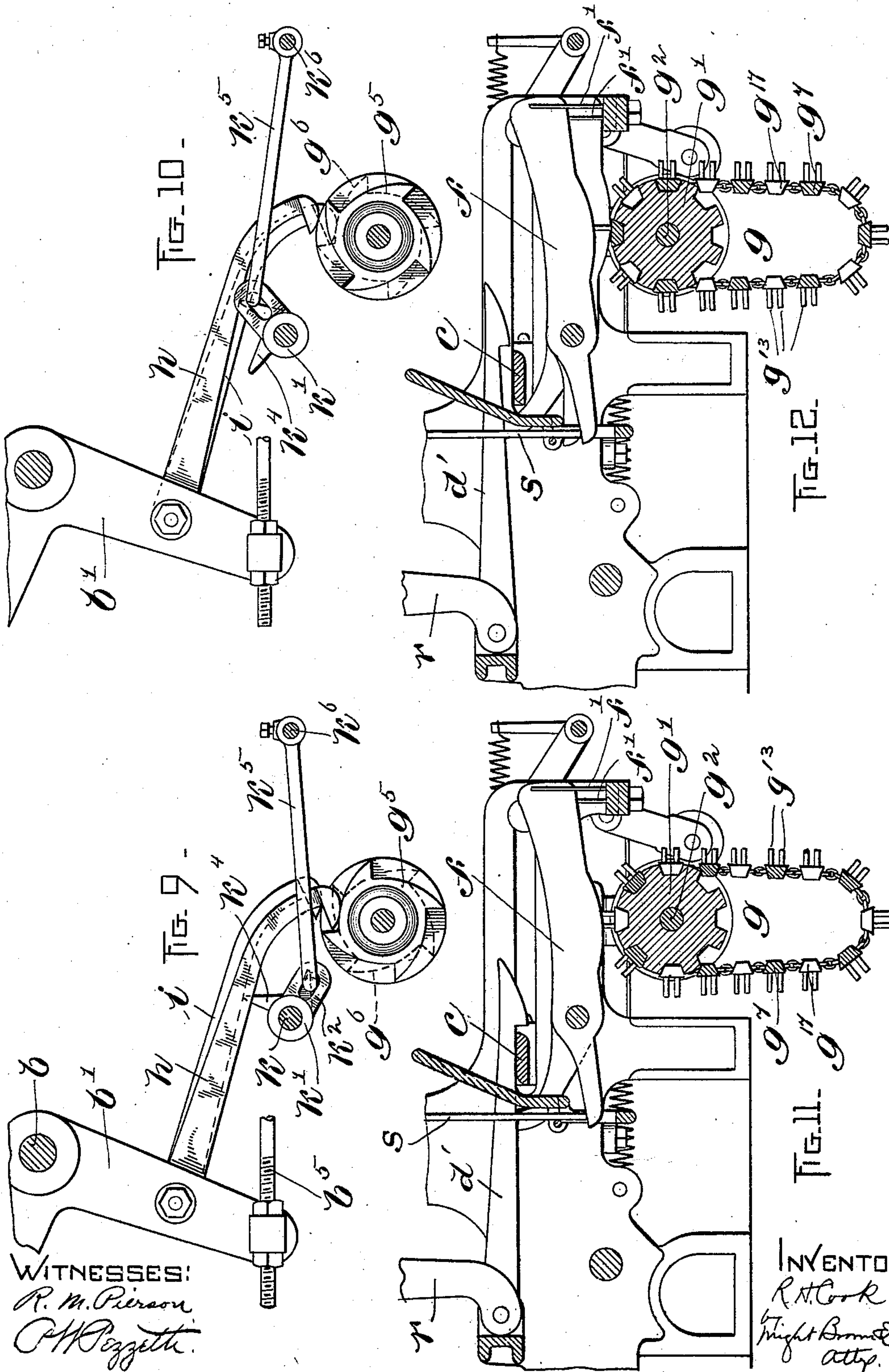
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(Application filed Oct. 29, 1898.)

(No Model.)

6 Sheets—Sheet 6.



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UNITED STATES PATENT OFFICE.

RICHARD H. COOK, OF FALL RIVER, MASSACHUSETTS.

SHEDDING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 636,493, dated November 7, 1899.

Application filed October 29, 1898. Serial No. 694,949. (No model.)

To all whom it may concern:

Be it known that I, RICHARD H. COOK, of Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Shedding Mechanism for Looms, of which the following is a specification.

This invention relates to jacquard and dobby weaving, and more particularly to the pattern-changing devices where all kinds of shedding mechanism are used on a loom requiring a long chain or card.

The invention has for its object to reduce the length of the pattern-surfaces heretofore employed for certain classes of work. As is well known, these pattern-surfaces or chains are sometimes very long and, together with their supports, take up considerable space.

The means of accomplishing the object stated, in which my invention consists, will be more fully explained hereinafter, and pointed out in the claims.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a front elevation of a dobby constructed in accordance with my invention. Fig. 2 represents a left-hand side elevation thereof. Fig. 3 represents a right-hand side elevation. Fig. 4 represents a top plan view. Fig. 5 represents a section on line 5 5 of Fig. 4. Figs. 6 and 7 represent side elevations of parts shown in Fig. 2, illustrating the operation of said parts. Fig. 8 represents a section on line 8 8 of Fig. 1. Figs. 9 and 10 represent details of the ratchet feed. Figs. 11 and 12 represent sections on the line 11 11 of Fig. 1, illustrating the operation of the pattern-surface.

The same reference characters indicate the same parts in all the figures.

The dobby illustrated in the drawings being of a well-known pattern familiar to those versed in the art a brief description only of its principal working parts will be necessary.

a is the frame, having bearings for a rock-shaft b , at the ends of which are keyed rock-levers b' b^2 , the former being provided with an arm or crank b^3 , having a wrist-pin at its end connected with a pitman b^4 . Said pitman receives motion from a suitable moving part of the loom and rocks the shaft b . The extremities of the rock-levers b' b^2 are connected by rods b^5 with the lifters or griffs c ,

which are mounted to slide in slots in the frame a . Through gratings a' a' project the upper and lower sets of hooked jacks d d' , Fig. 1, adapted to be engaged when selected by the pattern-surface by the lifters c c . The rear ends of the jacks are pivoted to connecting-levers r r , which are in turn pivoted to the harness-levers e , and when drawn forward by the lifters the said jacks cause their harness-levers to oscillate on the shaft e' and raise the corresponding harnesses. The jacks are operated by a series of fingers f f , held between a series of guide-pins f' f' and projecting over the pattern-surface or chain g , the lower set of jacks resting directly on one set of fingers, while the upper jacks are lifted by means of lifting-wires s s , connecting alternate fingers f with said jacks.

g' is the pattern-cylinder, supporting the chain g and secured to a shaft g^2 , which is mounted in bearings g^3 on the frame a . At one end of said shaft is a hand-wheel g^4 and at the other end is a double ratchet g^5 g^6 , cast for convenience in a single piece and fastened by a set-screw to the shaft.

h and i are two pawls pivoted on a stud h' on the rock-lever b' and having hooks at their ends adapted to engage the respective ratchets g^5 g^6 and rotate the shaft g . Only one of the pawls is active at a time. Each of the ratchets g^5 g^6 has four teeth, the teeth of one ratchet being set opposite the spaces between the teeth of the other ratchet, as shown, and the relation of the parts is such that at each rearward stroke of the lower end of the rock-lever b' the pattern-surface g is advanced by the operation of the pawl and ratchet then in action through the space of two of its lags or bars g^7 g^{17} . To the shaft g is secured a toothed check-wheel g^8 , having eight divisions, said wheel being engaged by a check-roll g^9 , carried at the end of a pivoted arm g^{10} , the latter having a spring g^{12} , which holds the roll in engagement with the wheel.

In accordance with my invention the pattern-surface g , as shown, in the present instance is made up of two series of bars or lags g^7 g^{17} , one series being distinguished from the other in Figs. 1, 11, and 12 by shading. The bars of one series alternate with those of the other, so that as long as the pattern-surface is fed two bars at each step the same series

of bars will always be presented to the fingers *ff*, controlling the shed-forming mechanism, when the surface *g* comes to rest. When the pawl *h* is active, the white bars will be brought into action, as shown in Fig. 11, and when the pawl *i* operates the dark bars will be employed, as shown in Fig. 12. The pins or studs *g*¹³ *g*¹³ of one series of bars—say the light bars *g*¹⁷—are so placed as to perform plain weaving, the heddles being grouped in the same manner during successive cycles of operations, while the pins in the other set of bars, as the dark bars *g*⁷, are so placed as to form a pattern in the fabric. The former series of bars will therefore all have their pins arranged in the same manner, while in the latter set of bars the pins will be arranged differently in each bar to form the pattern.

For the purpose of operating the feed to change the active series of pattern-surface bars from plain to fancy, or vice versa, I provide the following mechanism: On the right-hand side of the machine, on a stud *k*, is loosely mounted a collar *k'*, having a slotted crank-arm *k*² and two lugs *k*³ *k*⁴ placed substantially at right angles to each other and adapted to engage the under sides of the respective pawls *h* *i*. With the sleeve *k'* in the position represented in Fig. 3 the lug *k*⁴ is directed upwardly, while the lug *k*³ lies parallel with the pawls, so that the pawl *i* is held out of action, while the pawl *h* is permitted to engage its ratchet *g*⁵. The slotted crank-arm *k*² is engaged by the end of a lever *k*⁵, secured to a shaft *k*⁶, which extends across the machine and carries at its other end an arm or trip *k*⁷. This shaft is mounted in bearings *k*⁸ *k*⁸, bolted to the frame *a*. Underneath the arm *k*⁷ is hung a tappet-chain *k*⁹, said chain being carried on a sprocket-wheel *k*¹⁰, which is loosely journaled on the pattern-cylinder shaft *g*². A ratchet *k*¹² is secured by a set-screw to the hub of said sprocket-wheel *k*¹⁰, and on the other end of the hub of the latter is formed a check-wheel *k*¹³, engaged by a roll *k*¹⁴, which is mounted in an arm *k*¹⁵, pivoted to the frame. A spring *k*¹⁶ holds the check-roll in engagement with the wheel. The tappet-chain *k*⁹ is adapted to be driven by the engagement of a pawl *m* with the ratchet *k*¹², said pawl being pivoted on a stud *m*¹², secured to the left-hand rock-lever *b*².

The tappet-chain *k*⁹ is shown as provided in the present instance with a single projecting lug or tappet *k*¹⁷. When this tappet comes underneath the arm *k*⁷, as represented in Fig. 7, it lifts said arm and oscillates the shaft *k*⁶, rotating the sleeve *k'* from the position shown in Figs. 3 and 9 to the position shown in Fig. 10, and thereby shifting the pawls *h* *i* and bringing the latter one into action, while at the same time rendering the pawl *h* inoperative. This changes the feed of the pattern-surface, throwing the plain bars *g*¹⁷ out and bringing the fancy bars *g*⁷ into action.

Normally the pawl *m*, which drives the

ratchet *k*¹², is held out of action by means of a lever *m'*, pivoted on a stud *m*² and having one arm *m*³, which takes under the pawl *m*, and another arm *m*⁴, which is operated by a second tappet-chain *o*, the latter being carried by a sprocket-wheel *o*³, secured by a set-screw to the shaft *g*². The arm *m*³ and an arm *k*¹⁸, secured to the shaft *k*⁶, are connected by a spring *n*, which operates to hold the arms *k*⁷ and *m*⁴ in engagement with their respective tappet-chains. The tappet-chain *o* has two projecting lugs or tappets *o'* and *o*², either of which when it comes to rest underneath the arm *m*⁴ will elevate the same. When said arm is elevated, the pawl-engaging arm *m*³ is moved away from the pawl *m*, as shown in Fig. 6, and said pawl is therefore free to engage the ratchet *k*¹².

It will be noted that the pattern-surface *g* is represented in the drawings as composed of fourteen lugs or bars flexibly connected in the usual manner. The tappet-chain *o* has an equal number of links, and the second of its tappets *o*² is placed opposite one of the white or plain weaving-bars *g*¹⁷ of the pattern-surface. The first tappet *o'* is placed three links in front of the tappet *o*², opposite a dark or fancy bar *g*⁷.

The operation of the mechanism is as follows: Since the sprocket-wheel *o*³, carrying the tappet-chain *o*, is fast on the pattern-cylinder shaft *g*², said chain completes one cycle in the same time as the pattern-surface *g*. When the arm *m*⁴ is resting against the plain links of the chain *o*, the pawl *m* is prevented from engaging the teeth of the ratchet *k*¹²; but when the lug or tappet *o*² comes to rest underneath said arm *m*⁴, as represented in Fig. 6, said pawl engages the ratchet on the forward stroke of the lower end of the rock-lever *b*², and on the rearward stroke of the latter the pawl partially rotates the ratchet and moves the tappet-chain *k*⁹ ahead a distance of one link. Said tappet-chain *k*⁹ is therefore advanced one link at each complete cycle of the pattern-surface *g*. The first tappet *o'* on the chain *o* does not come to rest under the arm *m*⁴ so long as the pattern-surface is operating with its plain bars, because since the said tappet *o'* is opposite a fancy bar or is an odd number of links away from the second tappet *o*² it will be carried past the arm *m*⁴ by the action of the pawl *h* and ratchet *g*⁵ instead of resting underneath said arm. In passing underneath the arm *m*⁴ the said first tappet of course raises the arm and the pawl *m* starts to take a tooth of the ratchet *k*¹²; but before said pawl can engage the tooth the tappet *o'* has passed underneath the arm *m*⁴ and the latter is restored to its normal position, raising the pawl out of contact with the ratchet.

When by reason of the progression of the chain *k*⁹ its tappet *k*¹⁷ comes underneath the arm *k*⁷, the pawls *h* *i* are shifted, as previously described, and the pattern-surface at once begins to feed on the fancy bars. It con-

tinues to do so until the first lug o' on the chain o comes to rest underneath the arm m^4 , as said lug will do, since the progression of the chain o is now on the alternate links.

5 When this occurs, the pawl m engages the ratchet k^{12} and moves the chain k^9 ahead one link, moving the lug k^{17} out from beneath the arm k^7 , and thereby reshifting the pawls h *i*. This changes the feed back again to the plain
10 bars of the pattern-surface, on which it is kept until the lug k^{17} again comes to rest underneath the arm k^7 .

It will therefore be seen that the number of times the pattern is introduced into the
15 fabric per unit of length depends upon the length of the chain k^9 , or, more properly, upon the recurrence of the lug k^{17} . Obviously the chain k^9 can be made of any length and any number of raised lugs or tappets could be
20 provided therein. A chain with several lugs placed at unequal intervals would introduce the pattern into the fabric at unequal intervals. It is also obvious that the chain o would have the same action as hereinbefore ex-
25 plained if it were double the length illustrated and provided with a second pair of lugs o' o^2 opposite the first pair.

Having thus explained the nature of my invention and described a way of construct-
30 ing and using the same, although without having attempted to set forth all the forms in which it may be embodied or all the modes of its use, I declare that what I claim is—

1. In a shedding mechanism, a pattern-cyl-
35 inder, a pair of ratchets secured to its shaft and having their teeth staggered, each tooth

of a ratchet corresponding to two divisions of the pattern-cylinder or chain, the rock-lever b' , two pawls attached to the same end of said rock-lever and adapted to engage the
40 respective ratchets so as to render active either the one or the other of two series of pattern-indicators, a device movable to throw one of said pawls into action and the other out of action and vice versa, and pattern
45 mechanism controlling said device.

2. In a shedding mechanism, a pattern-cyl- inder shaft, means for revolving the same, a sprocket-wheel secured to said shaft and carrying a tappet-chain, a second sprocket-wheel
50 loosely journaled on said shaft, and having a ratchet whereby it may be rotated, a tappet-chain carried by said second sprocket-wheel and controlling the cylinder-revolving means, and a pawl controlled by the first said tappet-
55 chain and adapted to rotate the said ratchet.

3. In a shedding mechanism, a pattern-cyl- inder shaft, means for driving the same, a connected sprocket-wheel and ratchet loosely
60 journaled on said shaft, a tappet-chain carried by said sprocket-wheel and controlling the shaft-driving means, a pawl for rotating the said ratchet, and a pattern device carried and propelled by the pattern-cylinder shaft and controlling said pawl.
65

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

RICHARD H. COOK.

Witnesses:

WILLIAM H. BROOMHEAD,
PETER HARDMAN.