

(No Model.)

3 Sheets—Sheet 1.

J. RYLE.  
WARPING MACHINE.

No. 317,472.

Patented May 5, 1885.

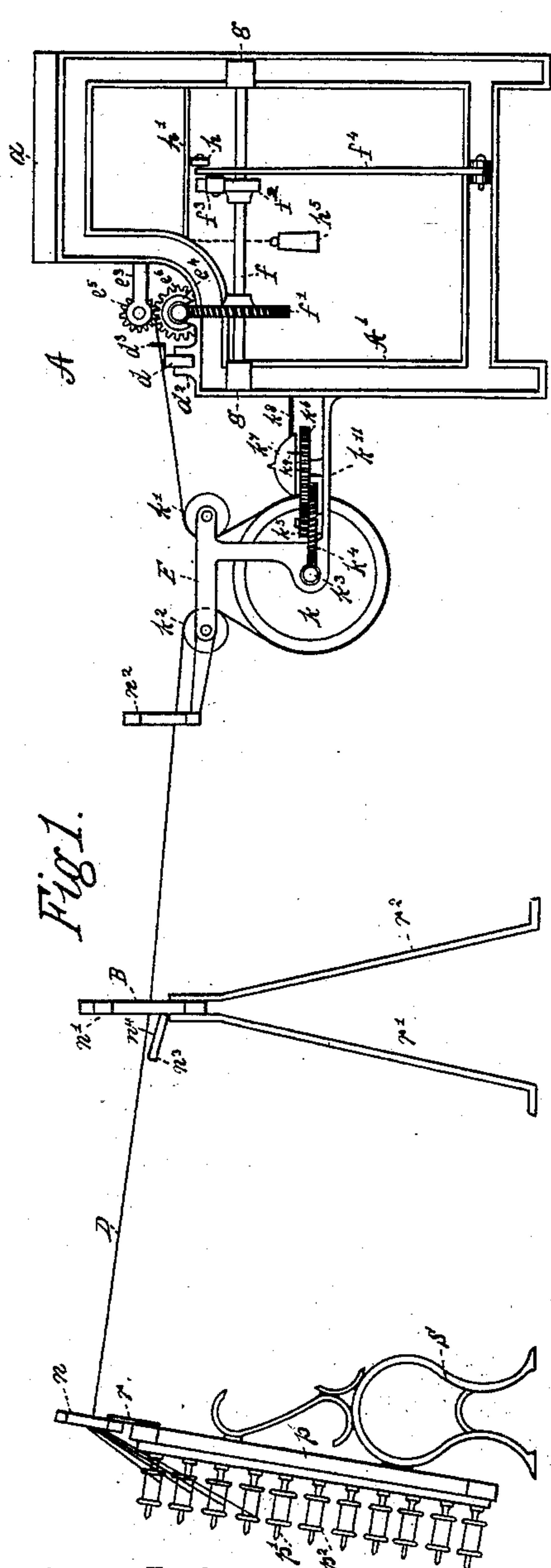
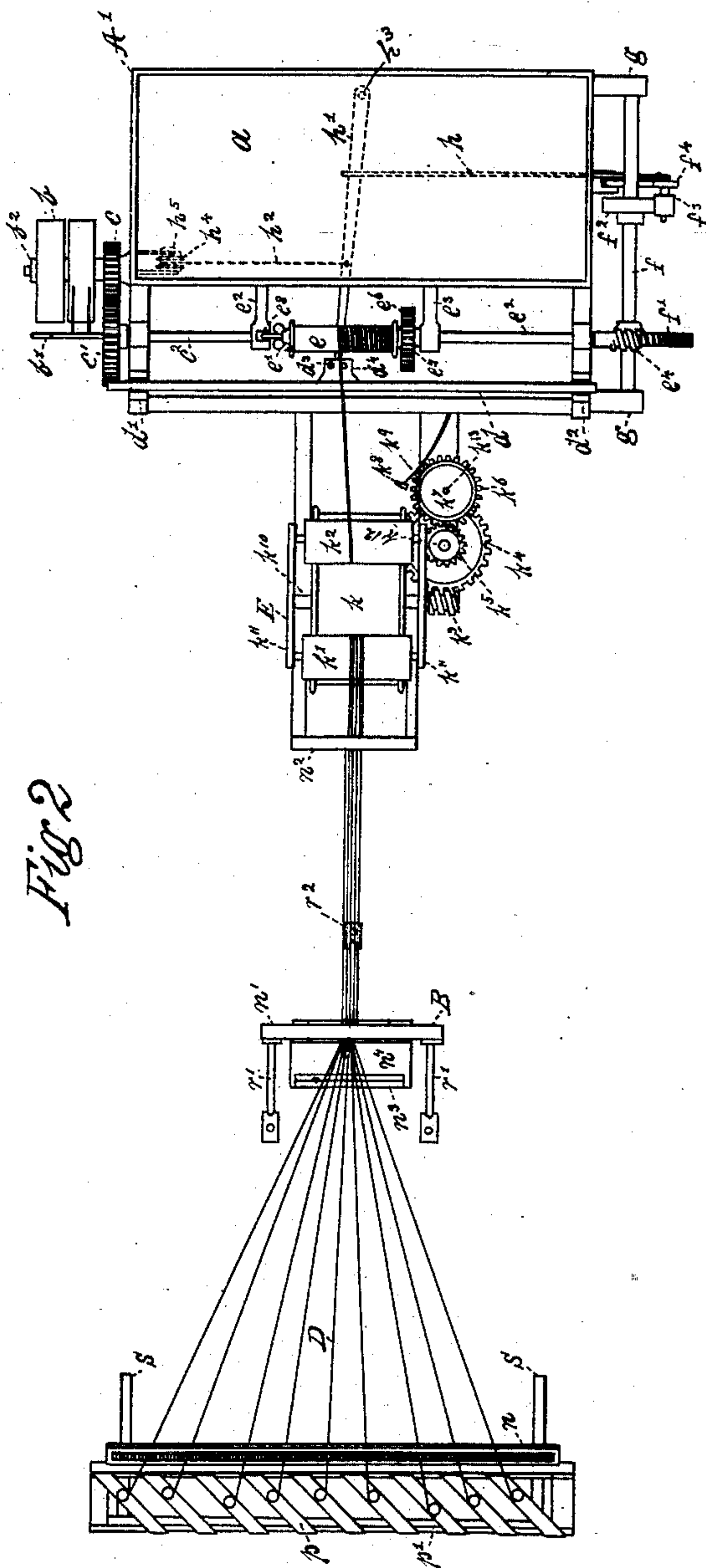


Fig. 1.

Fig. 2



Witnesses  
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Inventor  
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(No Model.)

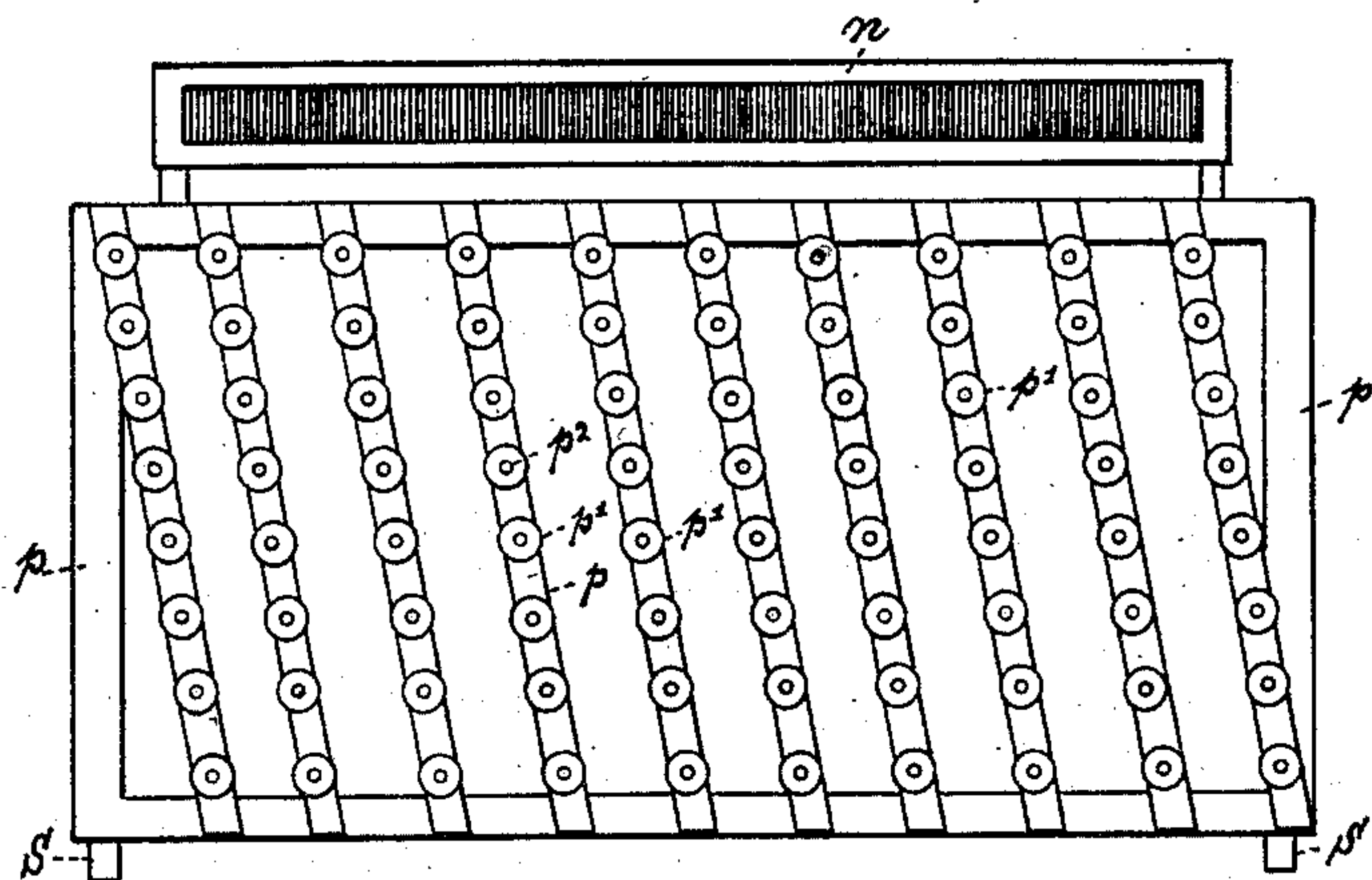
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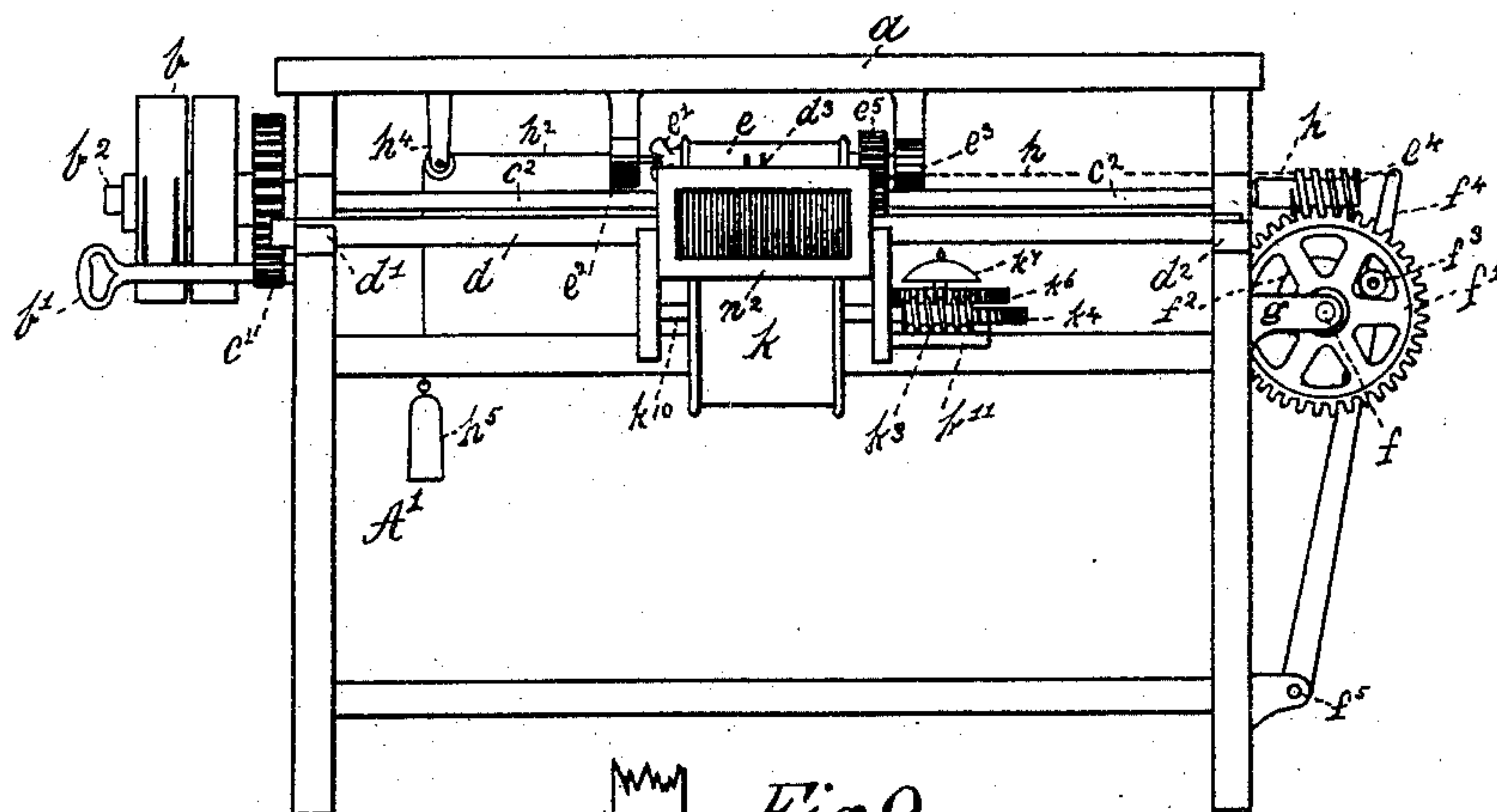
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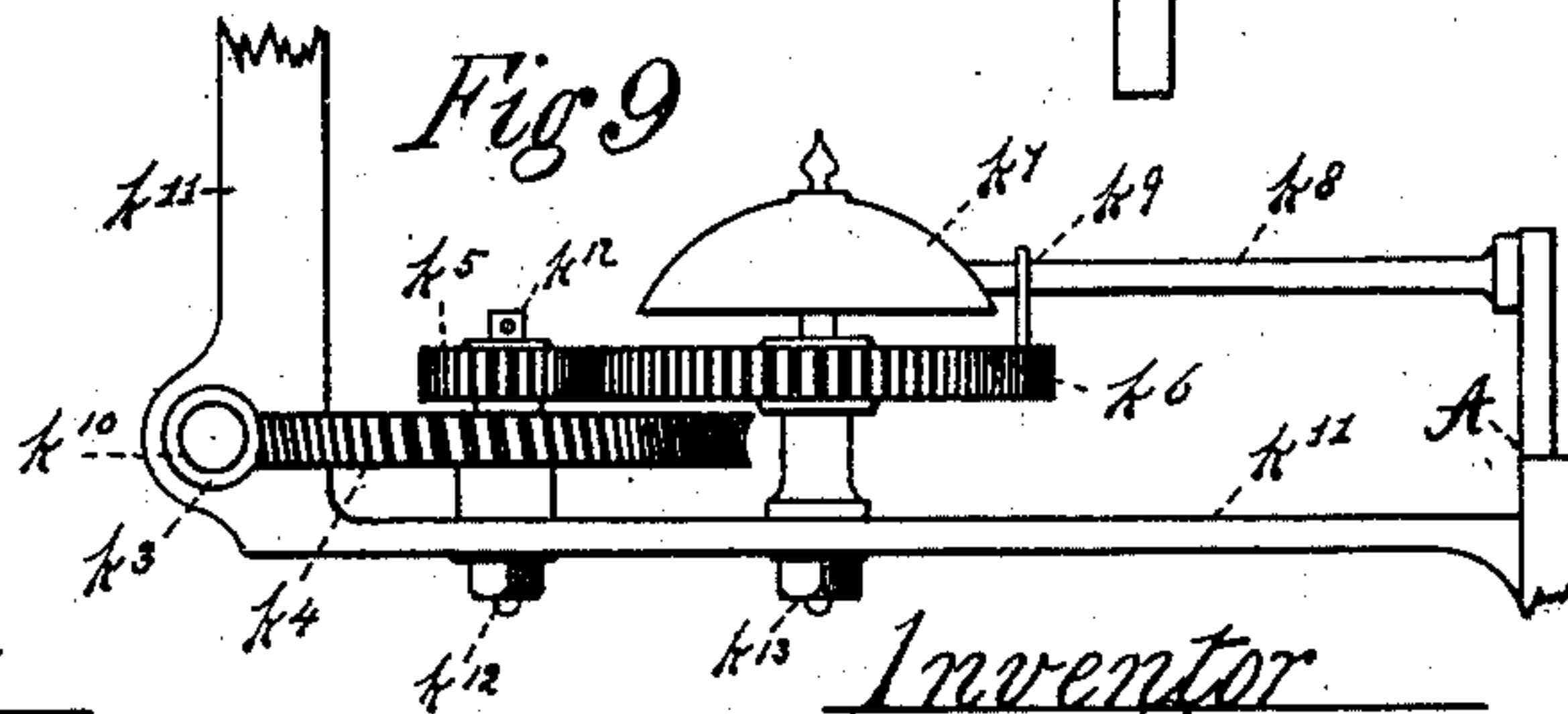
*Fig 3*



*Fig 5*



*Fig 9*



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3 Sheets—Sheet 3.

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Fig 4

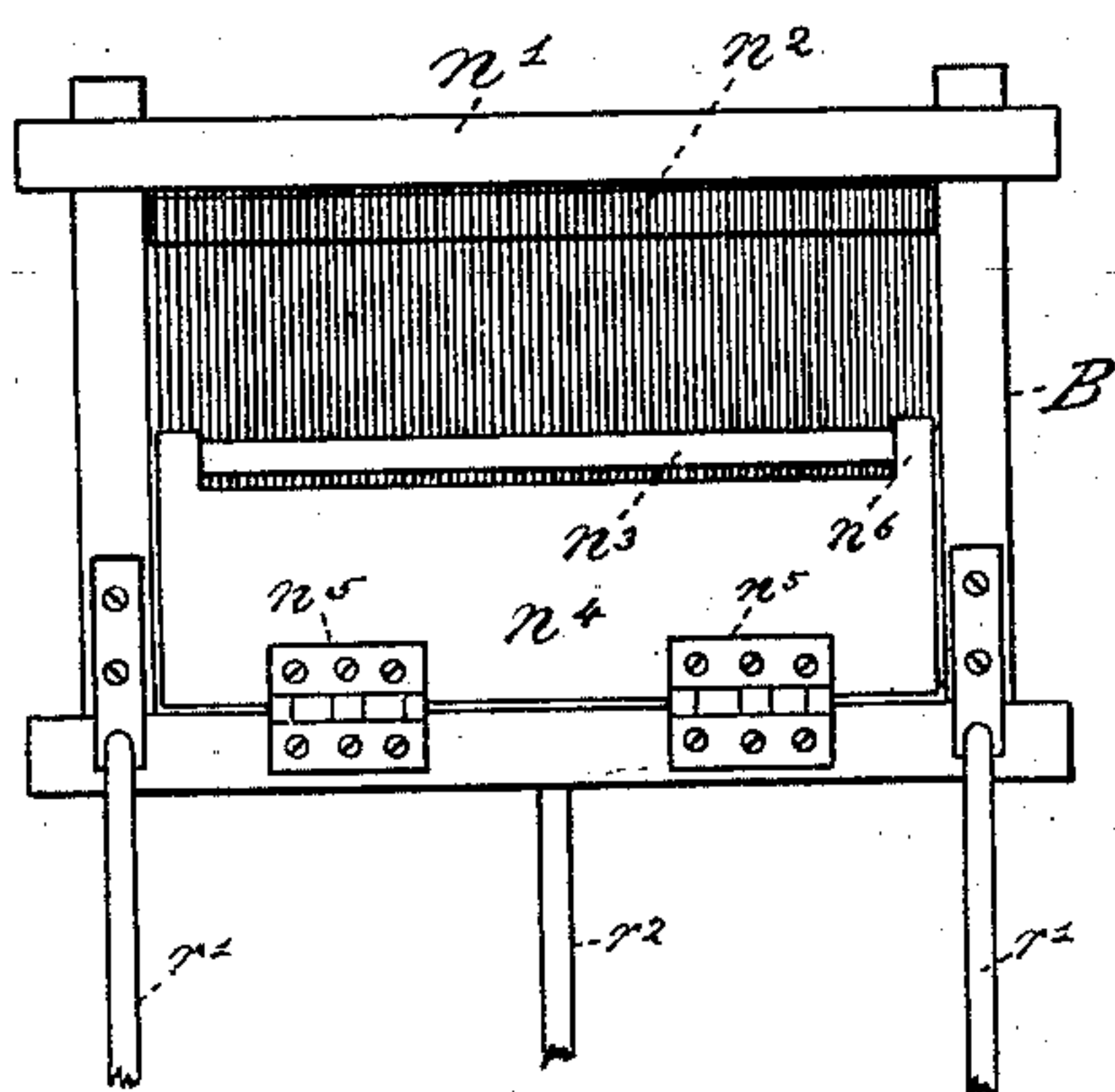


Fig 7

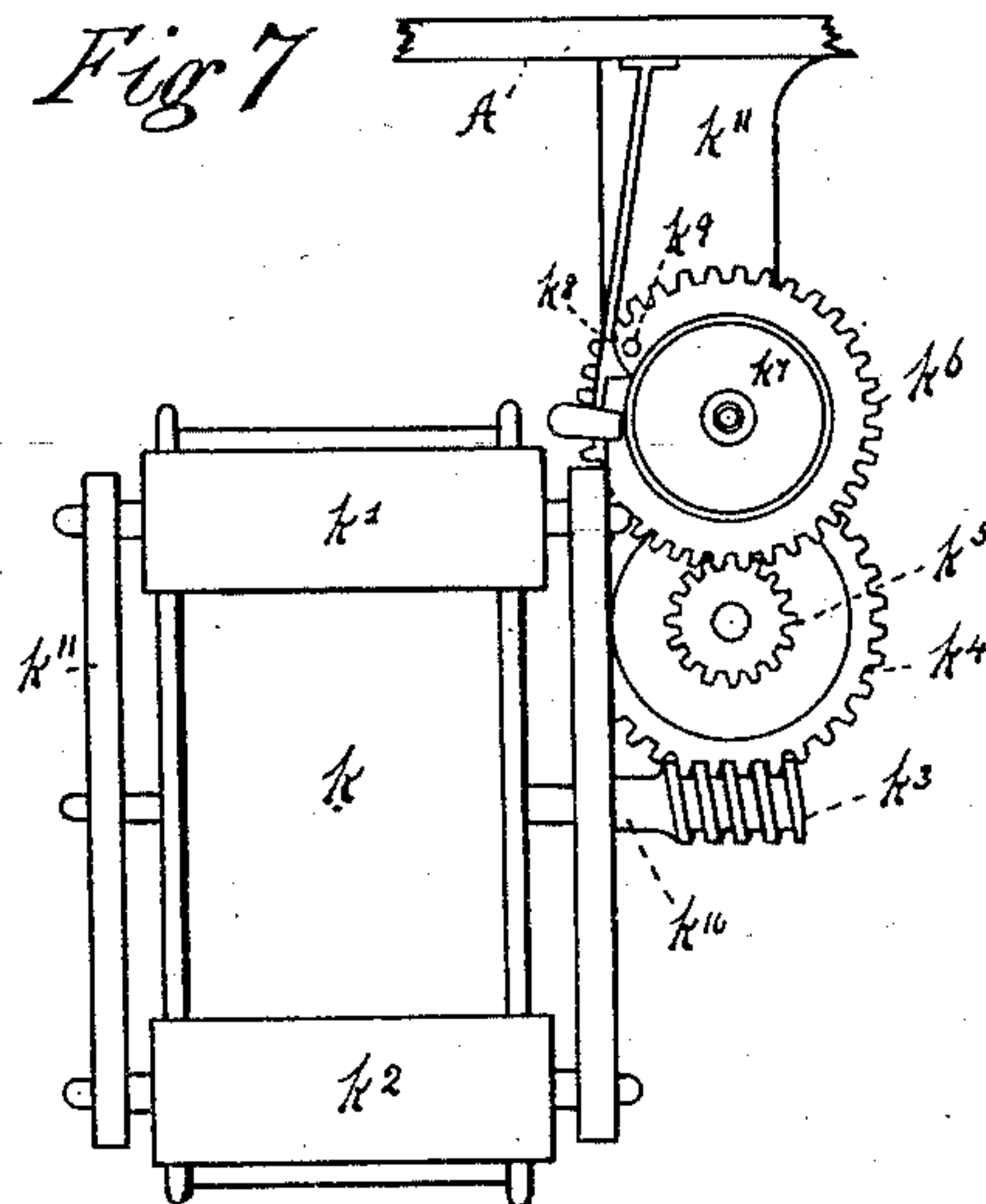


Fig 6

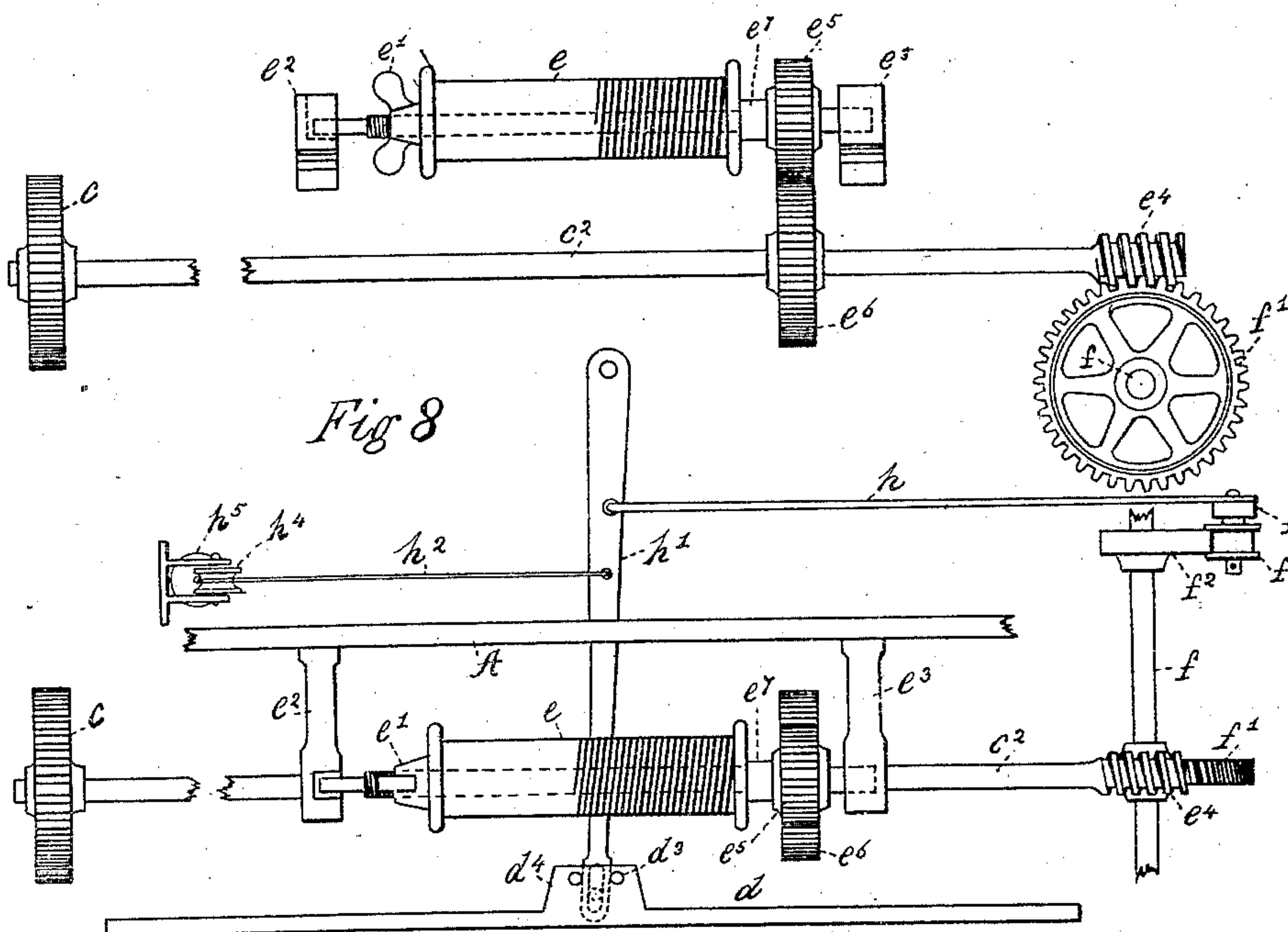


Fig 8

Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN RYLE, OF PATERSON, NEW JERSEY.

## WARPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 317,472, dated May 5, 1885.

Application filed January 29, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN RYLE, a citizen of the United States, residing at Paterson, Passaic county, State of New Jersey, have  
5 invented a new and useful Improvement in Warping-Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The invention consists of the devices and  
10 combination of devices illustrated in the drawings, which will be hereinafter fully explained.

Figure 1 of the drawings is a side elevation of a machine embodying my invention. Fig. 2 is a plan view thereof. Fig. 3 is a front view  
15 of some of the parts shown in Fig. 1. Fig. 4 is also a front view of some of the parts shown in Fig. 1. Fig. 5 shows the front of the machine in elevation. Fig. 6 shows a part of the driving mechanism in elevation. Fig. 7 is a  
20 plan of measuring mechanism. Fig. 8 is a part plan of traverse mechanism; and Fig. 9 is an enlarged view of some of the parts shown in Figs. 1 and 5.

A represents a power warping-machine having a frame, A', on and to which frame are  
25 arranged and secured various devices and driving mechanism, as follows: Suitably located on the upper part of the machine and secured to the frame A' there is a stud, b<sup>2</sup>, on  
30 which stud there are journaled pulleys b, one of which—the outer one—is loose, and the inner one—the main driving-pulley—is provided with a sleeve which carries a pinion, c, that meshes with a gear-wheel, c'. This wheel  
35 is arranged on and secured to one end of a shaft, c<sup>2</sup>. This shaft is journaled in bearings in the frame A', and has at its other end a worm, e<sup>4</sup>, fast on said shaft, which meshes with a worm-wheel, f', fast on a transverse shaft,  
40 f, which is journaled in bracket-bearings g g, secured to the frame A'.

More centrally located on and secured to the shaft f there is a cam, f<sup>2</sup>, which cam engages with a roller, f<sup>3</sup>. Said roller is journaled on  
45 a stud that is suitably secured to a lever, f<sup>4</sup>, which lever is pivoted at its lower end to a bracket on a pivot, f<sup>5</sup>; the lever f<sup>4</sup> connects by a link, h, to a lever, h'. Said lever is  
50 suitably arranged in a bracket that is suitably secured to a transverse bar, d, which bar is horizontally arranged in brackets d' d<sup>2</sup>, that are secured to the frame A'.

The bracket d<sup>4</sup> is provided with glass guides d<sup>3</sup>. The cord h<sup>2</sup>, provided with a weight, h<sup>5</sup>, passes over a grooved pulley, h<sup>4</sup>, and is secured  
55 to the lever h'. The pulley h<sup>4</sup> is journaled in a depending arm that is secured to the top or table a.

On laterally-projecting arms k<sup>11</sup>, secured to the frame of the machine, there are journaled  
60 in bracket E, secured to said projecting arms k<sup>11</sup>, rollers k' k<sup>2</sup>, and in the arms k<sup>11</sup> a measuring-wheel, k, having a shaft, k<sup>10</sup>, on which shaft there is arranged and secured a worm, k<sup>3</sup>, that meshes with a gear-wheel, k<sup>4</sup>, having  
65 a pinion, k<sup>5</sup>, that meshes with a gear-wheel, k<sup>6</sup>, which wheel is provided with a stud, k<sup>9</sup>, that engages with a hammer, k<sup>8</sup>. This hammer is secured to the frame A', and is so arranged as to strike the gong k<sup>7</sup>. The wheel  
70 k<sup>4</sup> and its pinion k<sup>5</sup> are arranged on a stud, k<sup>12</sup>, and the wheel k<sup>6</sup> and gong k<sup>7</sup> are arranged and journaled on a stud, k<sup>13</sup>, as shown in Fig. 9. Suitably secured to the frame A' are arms  
75 l<sup>2</sup> l<sup>3</sup>, in which arms is journaled a horizontal spindle, l<sup>7</sup>, provided with a bobbin, l, gear-wheel l<sup>5</sup>, and screw l', as shown in Fig. 6. Located at some distance from the machine proper there is a movable frame, B, having  
80 arranged and secured thereon a reed, n', and glass rod n<sup>3</sup>. Said rod is arranged in brackets n<sup>6</sup> secured to flap n<sup>4</sup>. The frame is provided with a flap, n<sup>4</sup>. Said flap is provided with hinges n<sup>5</sup>. The frame B is supported on standards r' r<sup>2</sup>, Fig. 4. More remote from the  
85 machine A' there is arranged a creel-frame, p, which frame is supported by standards s, and is provided with a reed, n, having dents r and pins p<sup>2</sup>, and supply-spools p', as shown in Figs. 1, 2, and 3. The machine is provided  
90 with the ordinary belt-guide b'.

The operation of the machine is as follows: Motion is given to the pulleys b by the ordinary means employed therefor, which motion, by means of pinion c and gear-wheel c', rotates the shaft c<sup>2</sup>, and by means of gear-wheels  
95 l<sup>6</sup> l<sup>5</sup>, worm l<sup>4</sup>, and worm-wheel f', rotates the spindle l<sup>7</sup>, its bobbin l, and shaft f, which shaft in turn, by means of cam f<sup>2</sup> and roller f<sup>3</sup>, reciprocates the lever f<sup>4</sup>. This lever, by means  
100 of link h, cord h<sup>2</sup>, pulley h<sup>4</sup>, and weight h<sup>5</sup>, imparts a reciprocating motion to the lever h'. pivoted to the frame at h<sup>3</sup>, which lever, in its connection with traverse-bar d, gives a hori-



zontal reciprocating motion to said bar. The parts mentioned having been put in motion in the manner stated, the several strands are taken from the spools  $p'$  upward through the reed  $n$  and between the dents  $r$ , and through the reed  $n'$  forward to and through the reed  $n^2$ , which last-mentioned reed is arranged as illustrated in the drawings. After the strands D have been taken through the reeds  $n$   $n'$   $n^2$  in the usual and well-known way, the warp end is passed over the top of the roller  $k^2$ , down under and around the wheel  $k$ , upward and over the roller  $k'$ , forward to the bobbin  $l$  and between the guides  $d^3$ , and is secured to the bobbin  $l$  in the usual way. The bobbin  $l$ , which is secured to the spindle  $l'$  by means of screw  $e'$ , being in rotation, draws the strands D which compose the warp from the spools  $p'$  through the reeds over rollers and measuring-wheel in the manner stated, and the warp thus formed and drawn by the bobbin  $l$  is laid evenly on and distributed over the same by the bar  $d$ , which bar is reciprocated by the traverse mechanism. The measuring-wheel  $k$ , having been put in rotation by the draft on the warp-strands D, caused by the rotation of the bobbin  $l$  by means of the worm  $k^3$ , rotates the worm-wheel  $k^4$ , the pinion  $k^5$  rotates the wheel  $k^6$ , which by means of stud  $k^9$  actuates the hammer  $k^8$ . Said hammer in its action strikes the gong  $k^7$ , and thus indicates the number of yards measured and wound on the bobbin  $l$ , by which means the warps are and can be made of even length, as follows: The wheel  $k$  having a measuring capacity of one yard at each revolution of the same, and the wheel  $k^6$  having been arranged by intermediates  $k^4$   $k^5$  to have one revolution to every sixty revolutions of the wheel  $k$ , it then follows that every action of the hammer  $k^8$  on the gong  $k^7$  will indicate sixty yards measured by the wheel  $k$  and laid on the bobbin  $l$ , and if the length of the warp is fixed at one hundred and eighty yards the wheel

$k$  would make as many revolutions, and the wheel  $k^6$  would have made but three revolutions, and would have so indicated by its action on the gong  $k^7$  by means of the stud  $k^9$  and hammer  $k^8$ .

It will be understood that by changing the intermediates a greater or less number of yards may be indicated at every revolution of the wheel  $k^6$ . The tension on the warp-strands D is regulated as follows: The reed  $n$  being more elevated than the reed  $n^2$ , as illustrated in Fig. 1, causes the tension or strain on the strands D to be increased as the frame B is moved nearer to the reed  $n^2$ , and, vice versa, when the frame B is placed nearer to the reed  $n$ , the tension or strain on the strands D is made less.

When it is desired to remove the tension and slacken the warp-strands, the hinged flap  $n^4$ , that carries the rod  $n^3$ , may be let down, which action will allow the warp-strands to fall and thus remove all strain from the same.

Having described my improved warping-machine and its operations, I claim and desire to secure by Letters Patent—

1. The frame B, having a vertically-movable flap and a bar attached thereto, over which the warp-threads pass, in combination with the devices for supplying and winding the yarn, substantially as set forth.

2. The hinged flap  $n^4$ , in combination with a frame to which is attached a glass bar attached to said flap, over which the warp-threads pass, and the devices for supplying and winding the yarn, substantially as set forth.

3. The hinged flap  $n^4$ , carrying the glass rod  $n^3$ , in combination with the frame B, to which it is attached, and the yarn-supplying and yarn-winding devices, substantially as set forth.

JOHN RYLE.

Witnesses:

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