

(No Model.)

2 Sheets—Sheet 1.

JOHN & JOSEPH NIGHTINGALE.

LET OFF MECHANISM FOR LOOMS.

No. 332,822.

Patented Dec. 22, 1885.

Fig 1

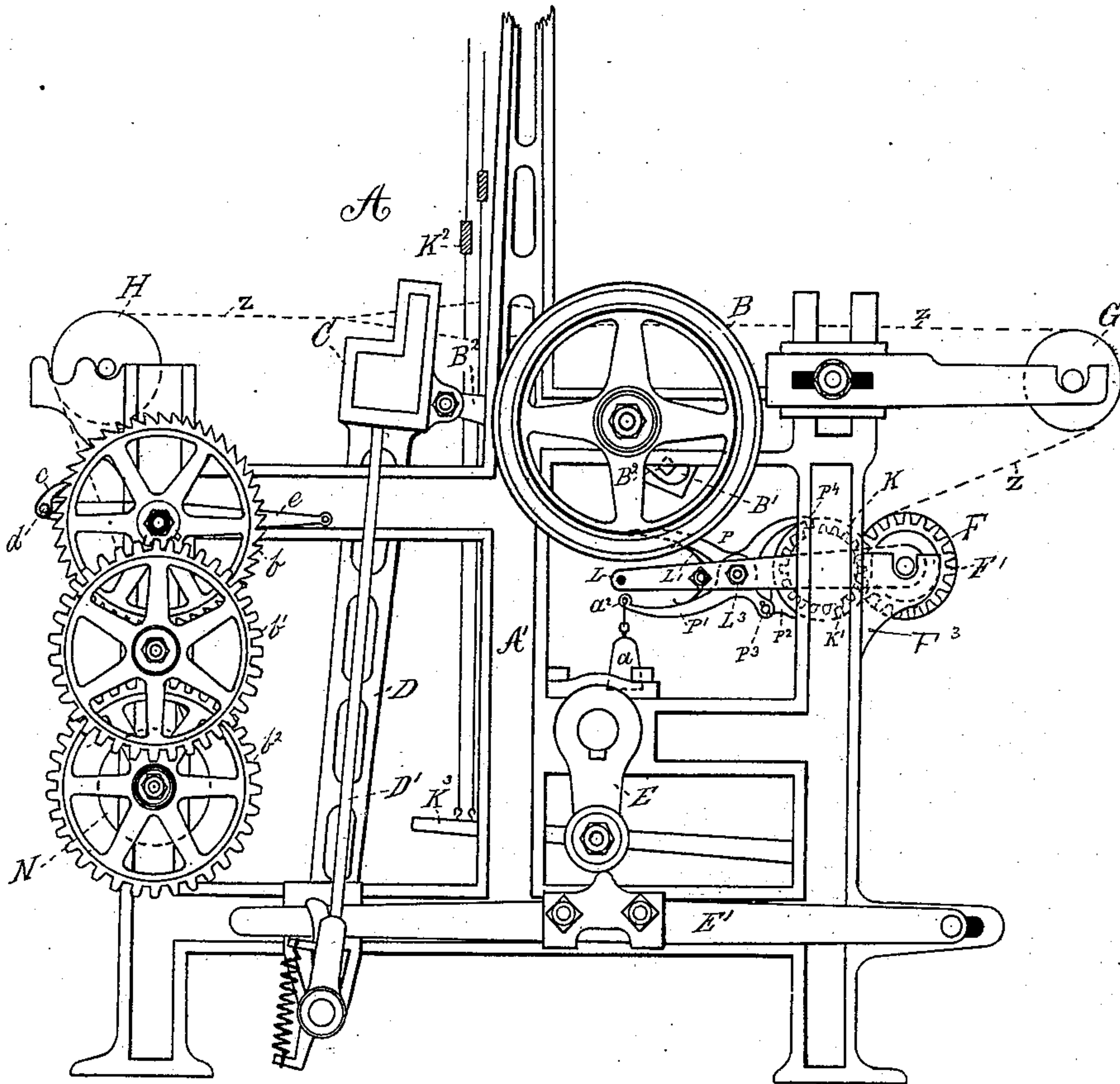
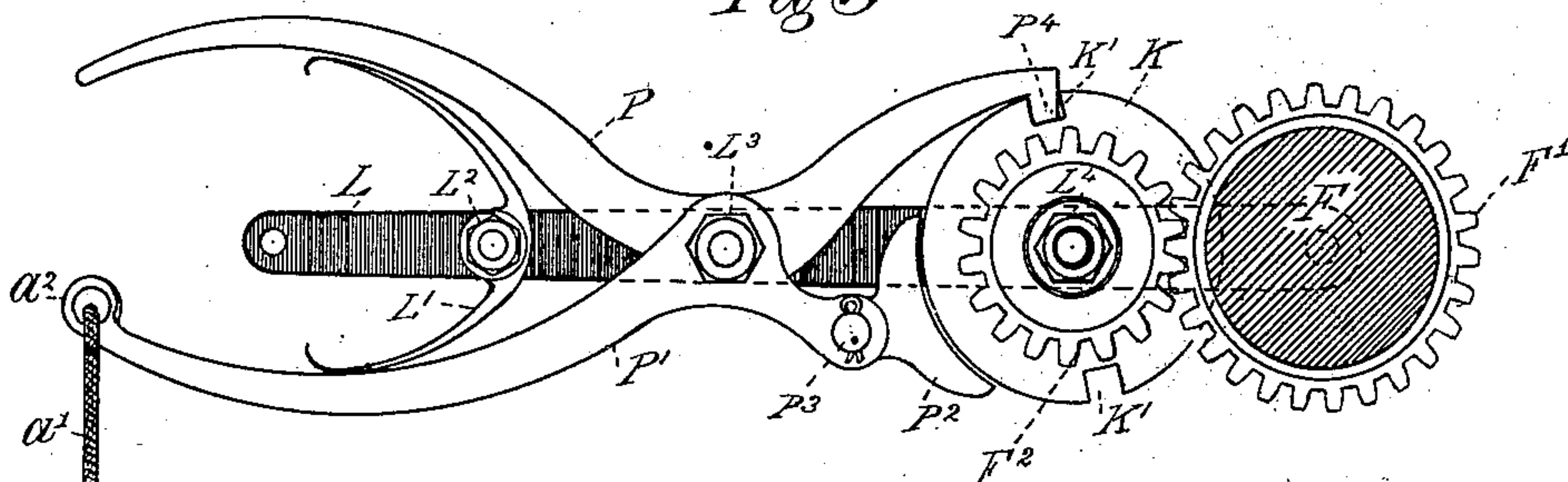


Fig 3



Witnesses
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(No Model.)

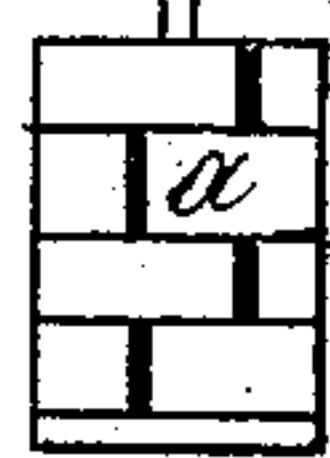
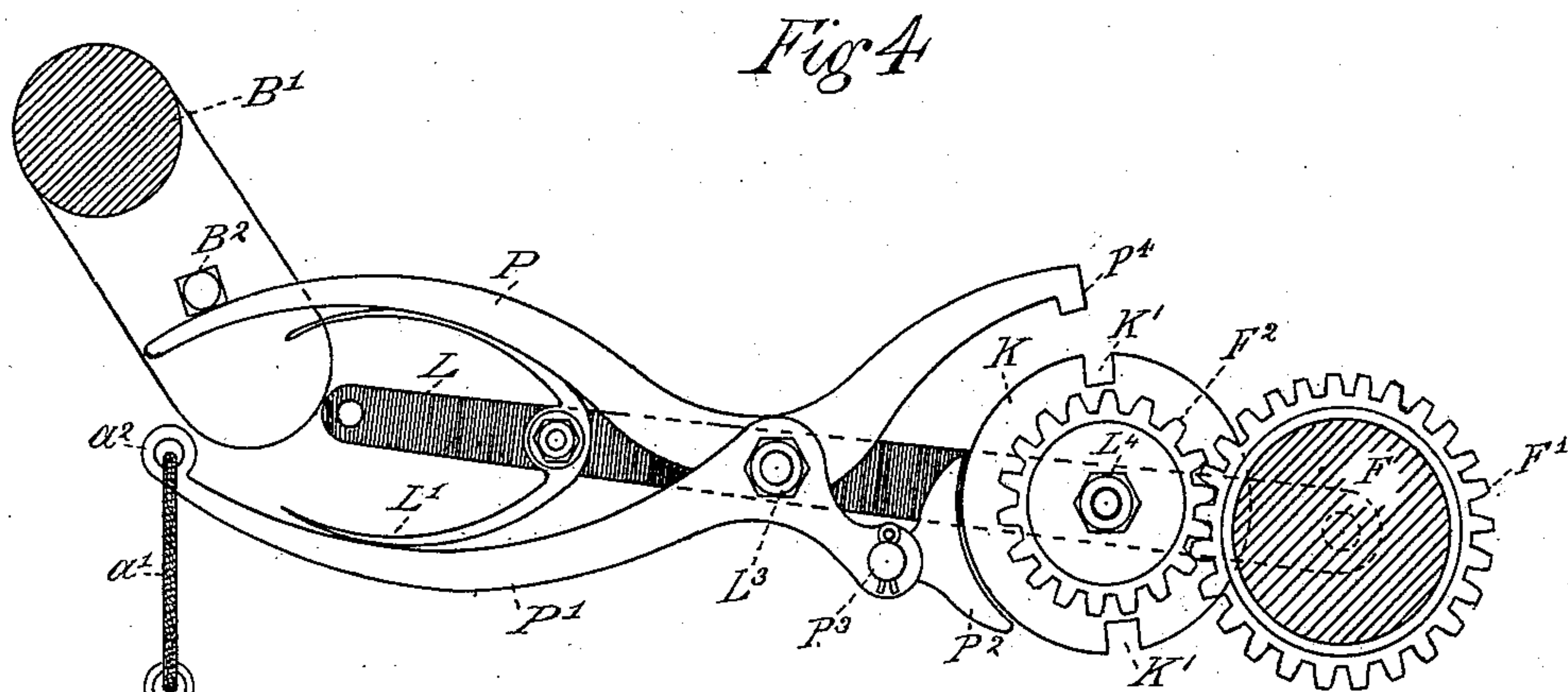
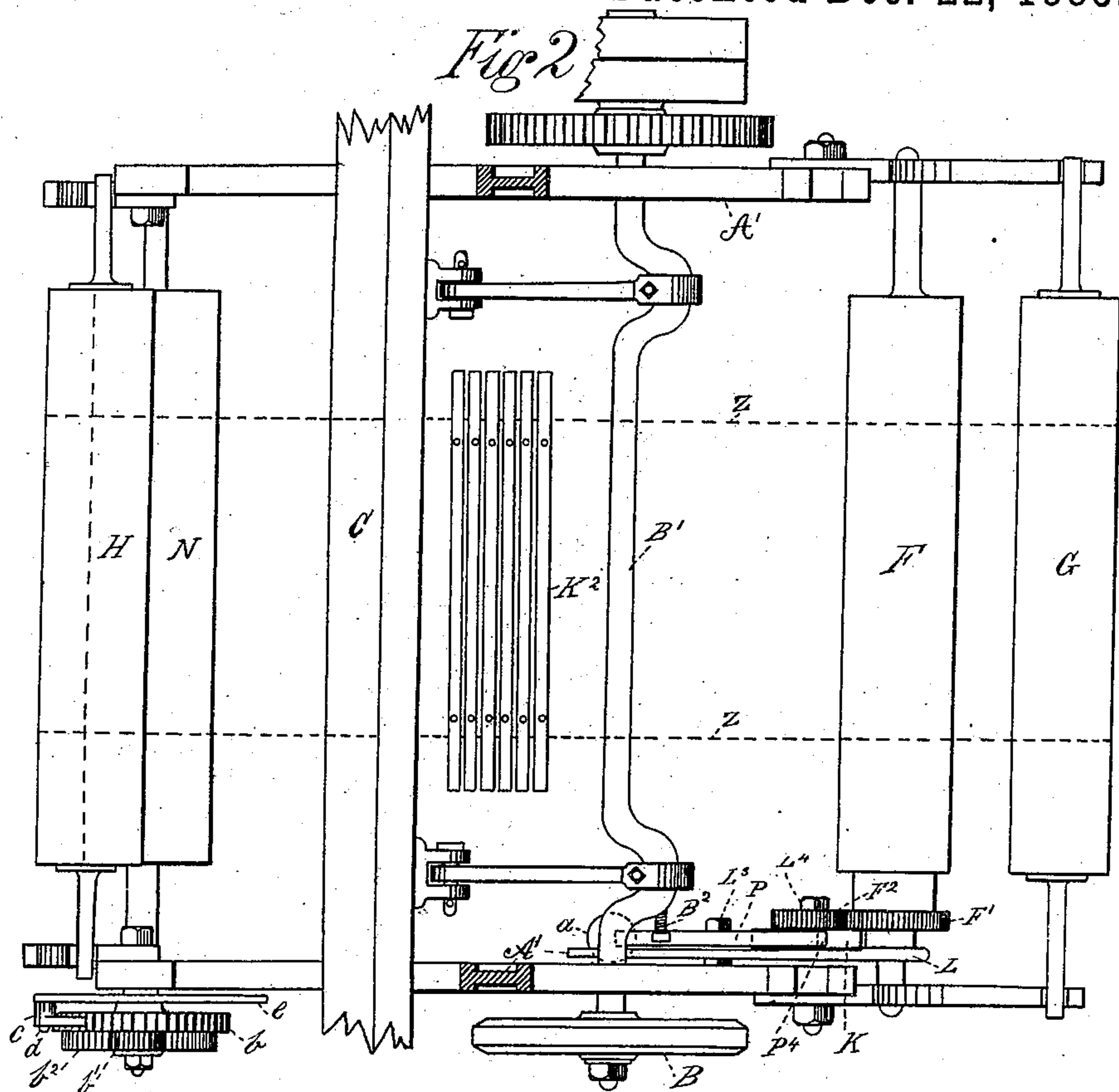
2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

JOHN NIGHTINGALE AND JOSEPH NIGHTINGALE, OF PATERSON, N. J.

LET-OFF MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 332,822, dated December 22, 1885.

Application filed September 23, 1884. Serial No. 143,764. (No model.) Patented in England December 13, 1884, No. 16,390; in France December 13, 1884, No. 165,909, and in Germany December 14, 1884, No. 31,897.

To all whom it may concern:

Be it known that we, JOHN NIGHTINGALE and JOSEPH NIGHTINGALE, citizens of the United States, residing at Paterson, Passaic county, State of New Jersey, have invented a new and useful Improvement in Let-Off Mechanisms for Looms, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

10 The object of our invention is to provide means by which the warp strands or threads may be delivered in the loom from the warp-roller with a uniform tension.

The invention consists in the combination, 15 with the loom-frame and warp-roller, of a carrying-lever journaled on the shaft of the warp-roller, a flange-wheel having notches, and a connected pinion which engages with a gear on the warp-roller, the wheel and pinion being journaled on a stud on the carrying-lever, a lever having a tooth to enter the notches in the flange-wheel, a weighted brake-lever having a brake shoe or plate to act on said flange-wheel, the brake-lever and toothed 25 lever being journaled on a stud on the carrying-lever, a spring secured to the carrying-lever between the toothed lever and brake-lever, and a stud on the crank-shaft to engage with and operate the toothed lever, all as hereinafter more fully explained and claimed. 30

Figure 1 of the drawings shows one end of an ordinary loom in elevation having our invention attached thereto, the top of the loom being removed. Fig. 2 is a plan of the same 35 with the loom-frame partly in section and the ends of the lay broken away. Fig. 3 is a partly-sectional detail view showing a part of our invention with the tooth of the toothed lever in the notch of the flange-wheel and the brake-plate acting on said flange-wheel. Fig. 4 is a similar view showing the parts of Fig. 3, and in addition a portion of the crank-shaft and the pin thereon, the pin being represented as acting upon the end of the toothed lever. 40

45 A represents a loom of the ordinary construction, having a warp-roller, F, which is journaled in brackets F³, that are secured to the loom-frame. On the end of the roller F we arrange and secure a gear-wheel, F'. On 50 the warp-roller shaft we journal a carrying-

lever, L. To the carrying-lever L we secure a stud, L⁴, on which stud we journal a flange-wheel, K, having notches K', arranged in the rim of the same to accommodate a tooth, P⁴, that enters the said notches K', as shown in 55 Fig. 3. The wheel K is provided with a pinion, F², that meshes with the gear-wheel F', arranged on the warp-roller F, more centrally on the carrying-lever L, and on a stud, L³. Secured to said lever we pivot two levers, P 60 and P'. The lever P, on its inner end, is provided with a tooth, P¹, which tooth is adapted to enter the notches K', formed in the flange-wheel K, as shown in Fig. 3. The lever P' has pivoted to its rear end a brake-plate, P², which 65 brake-plate is adapted to engage the flange-wheel K. The front end of the lever P' has an eye, a², arranged therein, in which eye there is secured one end of a cord, a', the other end of which has attached to it a weight, a, as 70 shown in Fig. 3. To the carrying-lever L, and between levers P and P', we arrange and secure by a bolt, L², a spring, L', which spring is adapted to engage levers P P', and the lever P is arranged to engage a stud, B², which stud 75 we secure on the crank B' of the crank-shaft, as in Figs. 2 and 4.

The loom is provided with the usual lay, C, roller H, balance-wheel B, tappet E, picking-sticks, heddles, &c. 80

The operation is as follows: The loom is supposed to be in motion. The warp-threads Z are taken from the roller F, over the roller G, through the loom in the usual way, over the roller H, and are secured to the cloth- 85 roller N. When the parts are in the position shown in Figs. 1 and 3, the tooth P¹ is in engagement with one of the notches K', and holds the wheel K from turning on the pin L⁴. The said wheel being thus locked to the lever, 90 strain on the warps produced by the taking up of the cloth or by the opening of the shed will rock the warp-beam in its bearings, and with it the lever L, against the resistance of the weight a. As the draft on the yarn continues the lever L will be raised until the end of lever P comes within the circle described by pin B² on the crank, when the said pin will strike the said lever and disengage the tooth P¹ from the notch of wheel K, thereby releas-

ing said wheel and leaving it and the pinion F^2 free to turn on the pin L^4 , as in Fig. 4. The rotation of the wheel and pinion, when thus released, is retarded by the friction of the plate or block P^2 upon the wheel K , thereby preventing any sudden relaxation of the tension on the warps. As the wheel and pinion rotate, the lever L will sink until another notch K' present itself to the tooth P^4 , which will enter such notch and again lock the parts, and so hold them until the lever L has been again raised sufficiently to carry the lever P into position to be struck by pin B^2 .

The cord a' can be made of any suitable length to allow the weight a to engage the floor and remove thereby from the warp-stands all tension when the warps are wanted to rest.

The periods of engagement of the device may be made more or less frequent, according to the number of notches K' arranged in the wheel K .

By this our invention a suitable and uniform degree of tension is preserved on the warp-stands while passing through the loom. As our devices are automatic in operation, they let off the warp with a uniform degree of tension at every movement of the shed, and just at the right time, thereby preventing unequal strain of the warp-threads on the harness and saving the harness from undue wear and early

fracture, whereas the drag-ropes now used for keeping tension on the warp-stands, owing to differences of temperature and the influence of such differences on such ropes, frequently let off the warp-stands unequally and by jerks, making the woven fabric or cloth ribby, bringing unequal strain from the warp-threads on the harness, and thereby causing early fracture of the same, and making it expensive to manufacturers.

Our automatic let-off mechanism is easily and cheaply attached, and applicable to all kinds of looms, saving much expense in the way of ropes and doing away with more than half of the weight usually used.

Having described our invention, we claim and desire to secure by Letters Patent—

The combination, with the loom-frame, the warp-roller F , and the gear-wheel secured to said roller, of the lever L , the gear-wheel F^2 , the wheel K , having notches K' , the stud L^4 , the lever P , having the tooth P^4 for engagement with the notches K' , the lever P' , the brake-plate P^2 , the weight a , the cord a' , the stud L^3 , the spring L' , the crank-shaft, and the pin B^2 , substantially as described.

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