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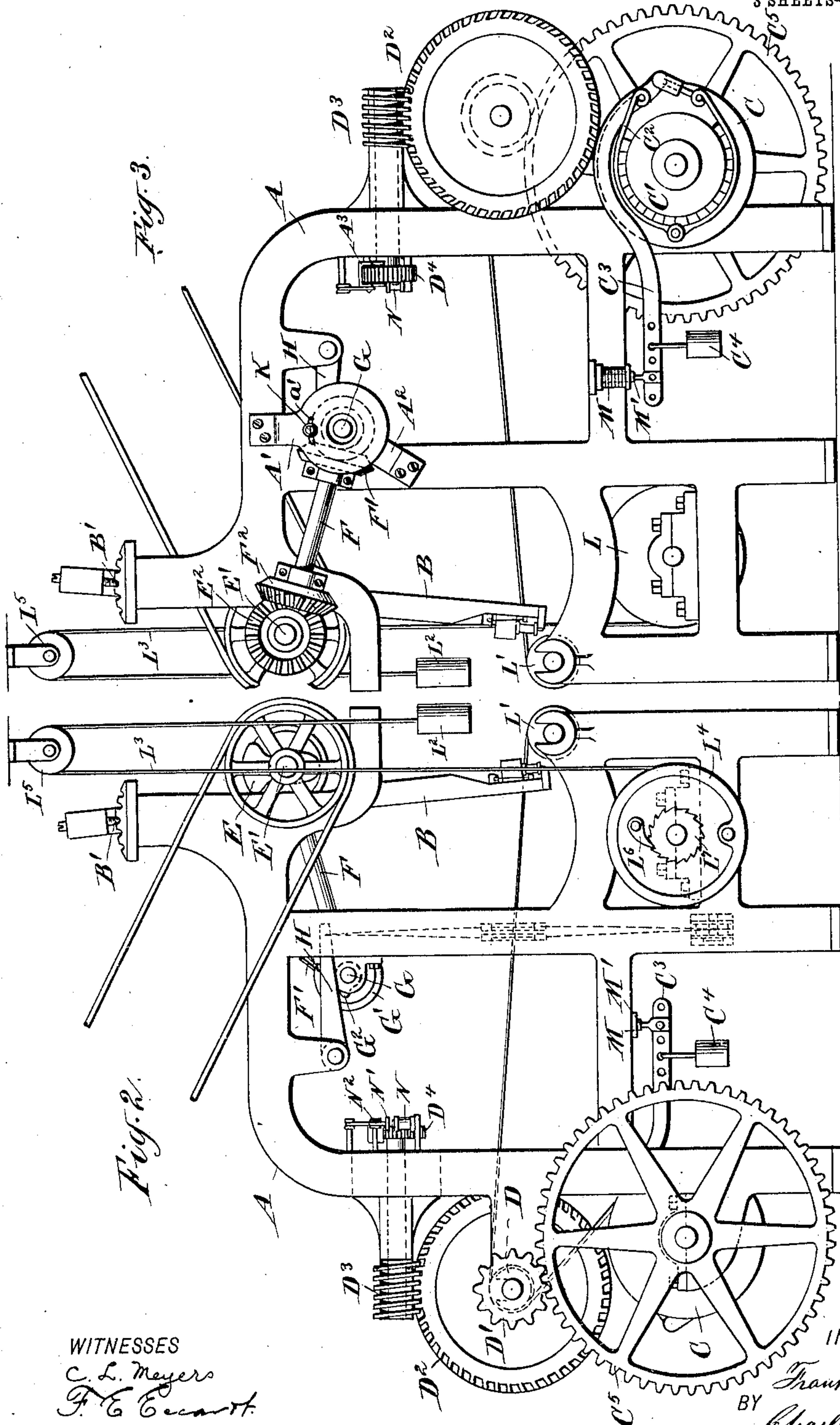
PATENTED NOV. 19, 1907.

F. JOHNSON.

LOOM.

APPLICATION FILED AUG. 28, 1906.

3 SHEETS--SHEET 2.



WITNESSES

C. L. Meyers

F. E. Everett.

INVENTOR

BY Frank Johnson,
Charles R. Seate

ATTORNEY

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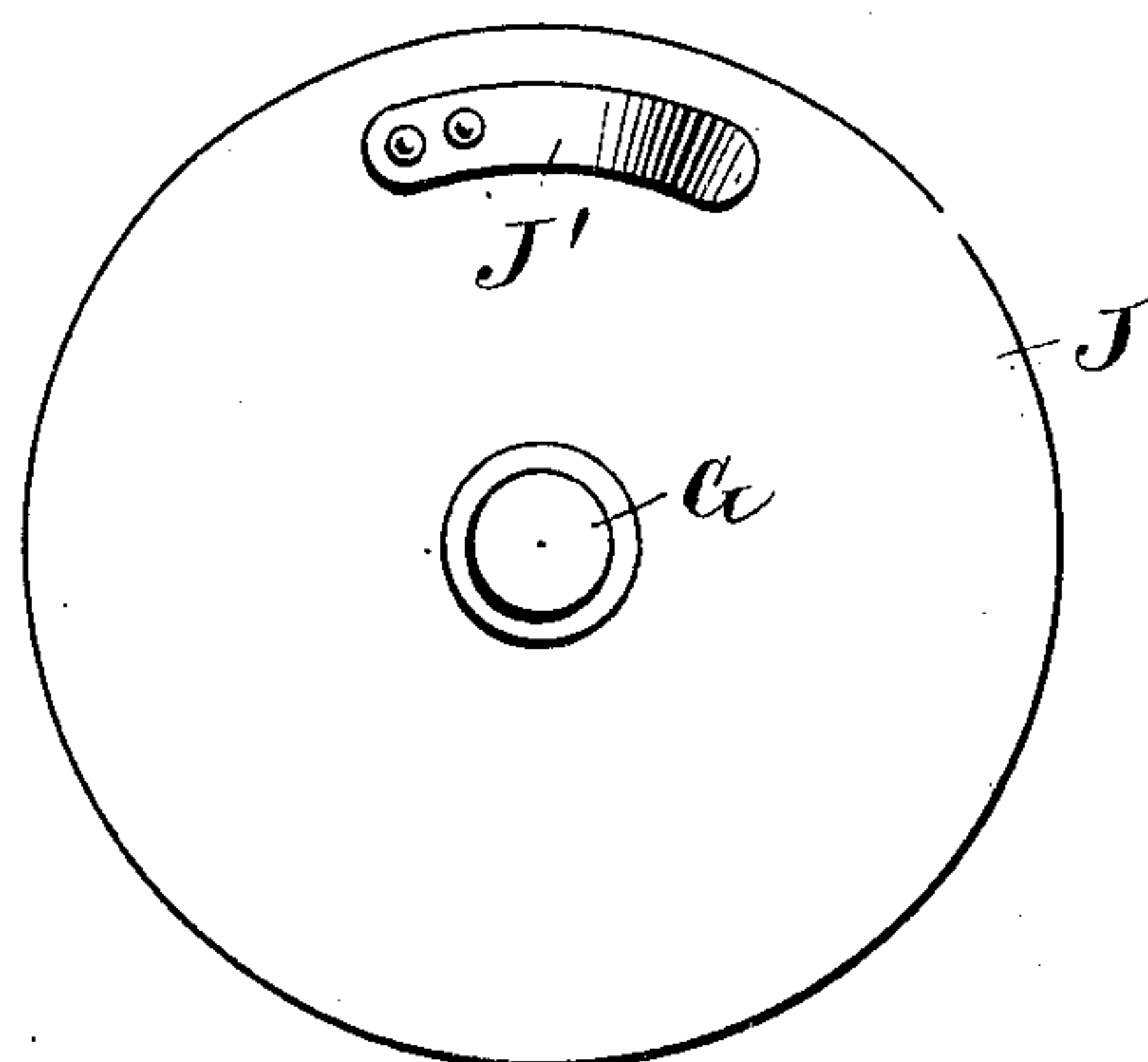
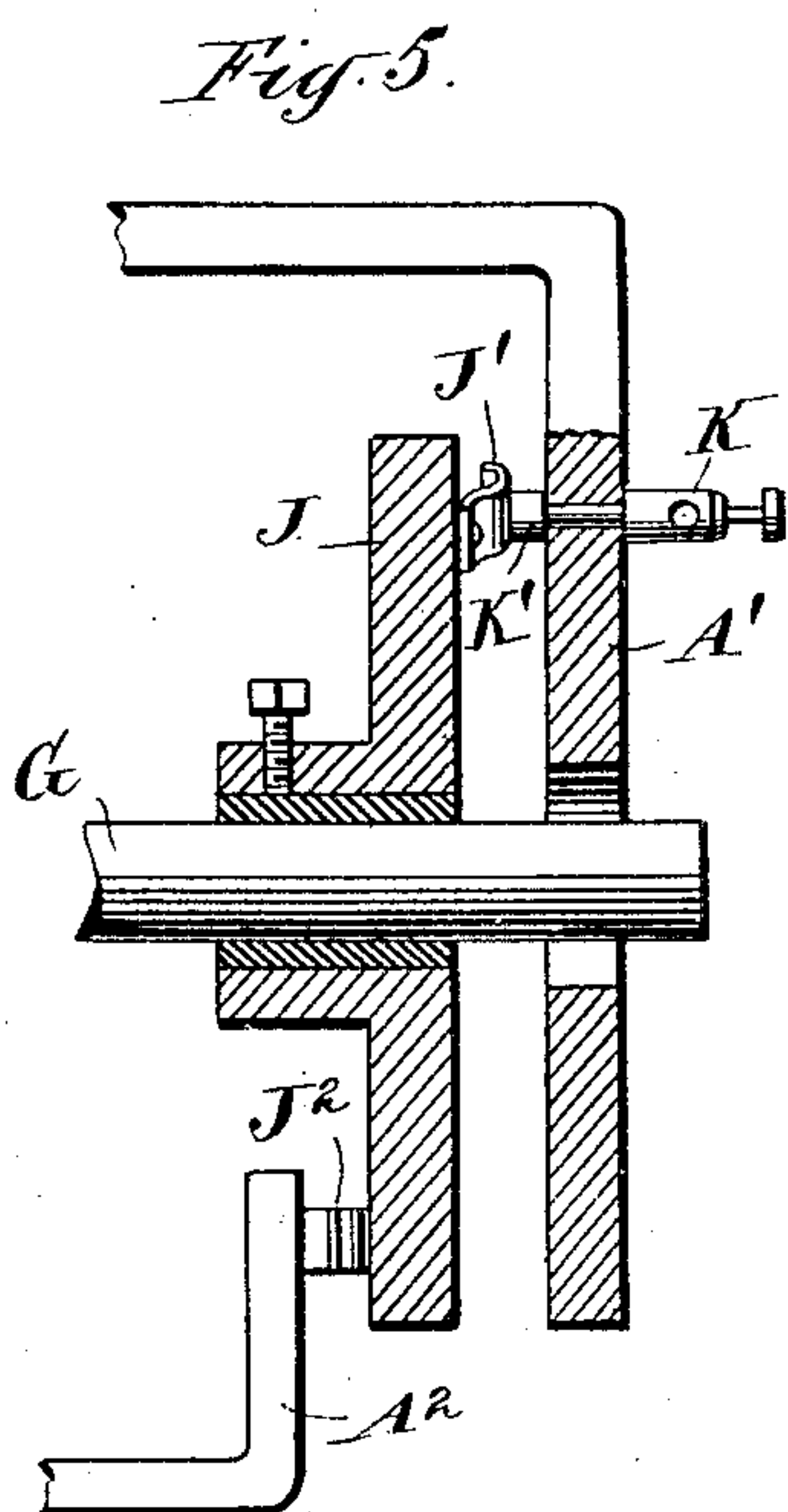
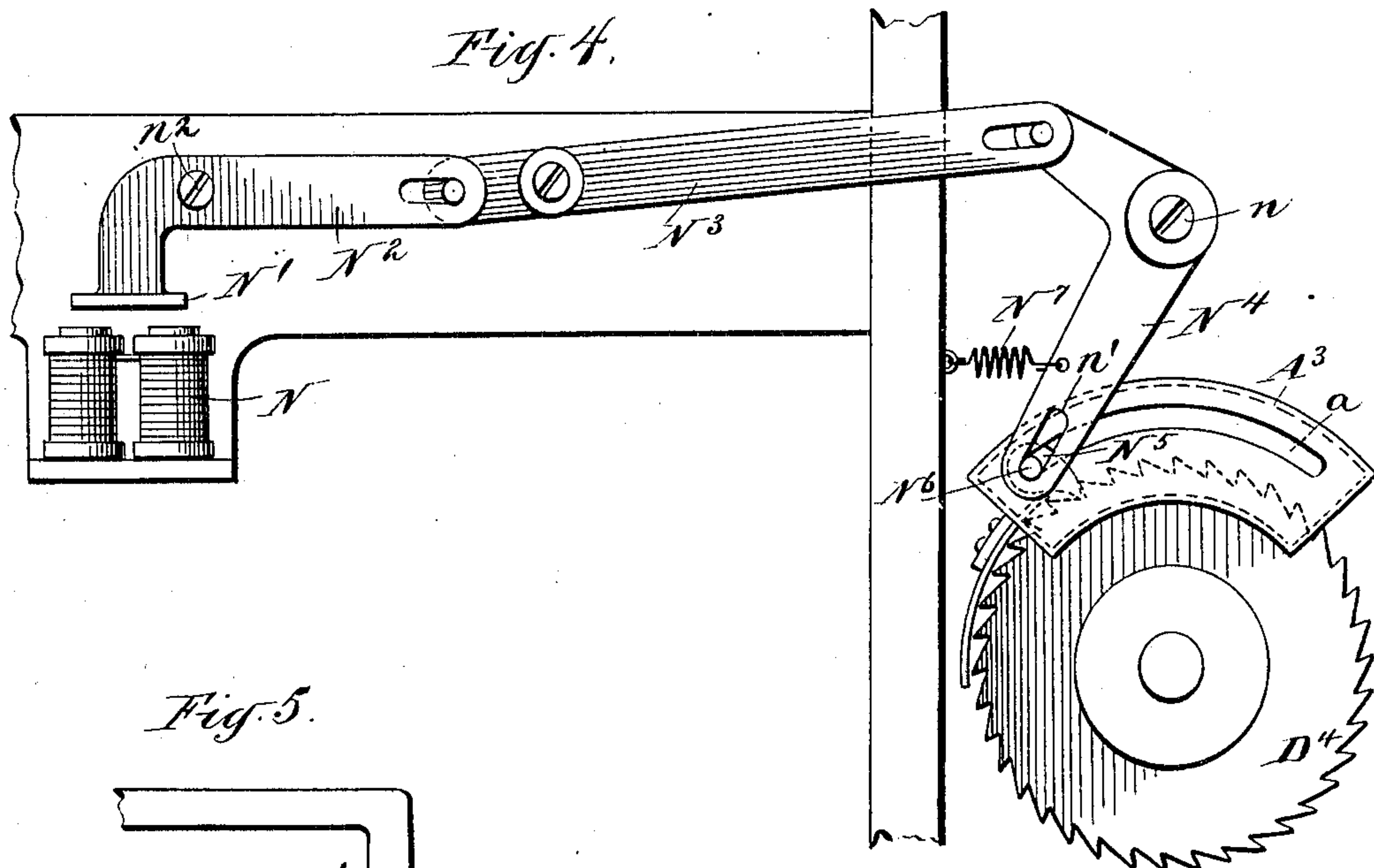
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C. L. Meyers
J. E. Edwards

INVENTOR
Frank Johnson
BY
Charles R. Seavey
ATTORNEY

UNITED STATES PATENT OFFICE.

FRANK JOHNSON, OF NEW YORK, N. Y.

LOOM.

No. 871,224.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed August 28, 1906. Serial No. 332,320.

To all whom it may concern:

Be it known that I, FRANK JOHNSON, a citizen of the United States, residing in the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Looms, of which the following is a specification.

The invention relates more particularly to looms for weaving wire fabrics and to the take-up and let-off mechanism for such looms.

The object of the invention is to provide simple and positively-acting mechanism for taking-up the woven fabric and for automatically letting-off a predetermined length of warp-wires at proper intervals.

The invention consists in certain novel features and details of construction by which the above objects are attained, to be hereinafter described.

The accompanying drawings form a part of this specification and show a preferred form of the invention as applied to a loom, with so much of the weaving mechanism as is necessary to show the relation of the invention thereto.

Figure 1 is a front elevation of a loom equipped with the invention. Figs. 2 and 3 are elevations of the opposite sides of the loom. Fig. 4 is an elevation on a larger scale showing the feeding device for the let-off mechanism. Fig. 5 is a vertical section partly in elevation showing the controlling means for such mechanism. Fig. 6 is a face view of a portion shown in the preceding figure. Fig. 7 is a diagram showing the electric circuit.

Similar letters of reference indicate the same parts in all the figures.

A A are the side-frames of the loom, and B is the batten or lay swung from centers B¹ B¹ at the top of the frames and equipped with a reed and shuttle-throwing means, not shown, but which may be understood to be similar to that described in Letters Patent to me dated April 12, 1904, No. 757,121. The lay is caused to swing by double cams E carried on the main shaft E¹ and makes two beats or oscillations to each pick, as in the above patent.

At one end of the shaft E¹ is a bevel gear-wheel E² meshing with a similar wheel F² on the upper end of an inclined shaft F carrying at its lower end a smaller bevel gear-wheel F¹ in mesh with a similar wheel G¹ on

a horizontal shaft G extending transversely of the loom parallel with and in rear of the main shaft E¹ and revolving at the same rate. The shaft G carries cams G² acting on heddle-levers H to which is attached the harness for operating the heddles. The gearing from the main shaft is so proportioned as to induce one change of shed to the above-described two beats of the lay.

J is a controller or commutator carried on the projecting end of the shaft G, consisting of a circular disk of metal insulated from the shaft and having a spring contact-piece J¹ on its outer face adapted to make wiping contact with a fixed contact-point K¹, carried on an arm A¹ of the frame, and connected to a binding-post K. Another fixed arm A² carries a spring J² in continuous wiping contact with the inner face of the disk and serves to complete an electric circuit through the latter and any electric devices connected to the binding-post K. The circuit is shown in Fig. 7.

The warp-beam is marked C and carries the warp-wires as usual. It has a drum C¹ at one end partially encircled by a brake-strap or shoe C² attached to a brake-lever C³ held by a weight C⁴ in position to hold the drum and warp-beam against revolving, and raised to release the warp-beam by the action of a solenoid M fixed to the frame, and receiving a core M¹ attached to the brake-lever. The solenoid is in the circuit and when the latter is completed through the spring contact-piece, is energized during such short period of contact and draws in its core M¹ to lift the brake-lever and permit a short length of warp-wires to be drawn off. The warp-wires are led over a guide-roller D having at one end a pinion D¹ in mesh with a gear-wheel C⁵ on the warp-beam so as to revolve therewith and at the other a worm-wheel D² engaged by a worm D³ rotated to turn the guide-roller and warp-beam by an electrically operated feed-mechanism. The warp-wires are led from the inner face of the warp-beam upwardly beneath and partially around the outer face of the guide-roller so that the opposite rotation of the beam and roller due to their gear and pinion tends to move them in the same direction as the travel of the warp-wires thereover.

The electric feeding-device for the worm D³ may be variously constructed, I have shown a ratchet-wheel D⁴ on the end of the worm-shaft engaged by a pawl N⁵ moving in

an adjustable casing A^3 mounted concentrically to the ratchet-wheel; the pawl is guided by its pins or trunnions N^6 in concentric slots a in the casing and is actuated by a bell-crank lever N^4 fulcrumed at n and receiving one of the pins N^6 in a slot n^1 in its long arm. The bell-crank lever is oscillated by the movement of an armature N^1 toward the cores of an electro-magnet N energized by a current through the binding-post K . The armature is joined to the short arm of a bent-lever N^2 fulcrumed at n^2 and connected through its long arm to the short arm of a straight intermediate lever N^3 the long arm of which is in turn connected to the short arm of the bell-crank lever N^4 .

The short downward pull of the magnet, augmented through the system of levers, tends to move the pawl through a considerable arc, making a full or complete stroke and inducing the maximum turn of the worm-shaft and permitting the longest feed. The length of feed is regulated by varying the position of the casing A^3 , the end of the slot a in the latter serving as a stop and determining the extent of the return movement of the pawl due to the action of the spring N^7 . By properly positioning the casing A^3 the amount of feed may be proportioned very exactly to the requirements.

L is the cloth-beam at the front of the loom receiving the woven goods after its passage over the breast-beam L^1 . It is subjected to the constant tension of a weight L^2 suspended from a cord L^3 wound on a drum L^4 and extending upward over a pulley L^5 . The weight is elevated after each descent by re-winding upon the drum which is connected to the cloth-beam by the pawl L^6 acting upon the ratchet-wheel L^7 .

The binding-post K is set in a concentrically curved slot a^1 in the arm A^1 so that it may be adjusted in the path of the spring-contact J^1 and the action of the brake and feed mechanisms accurately timed relatively to the movements of the heddles and lay.

Although I have described the brake as released by the action of a solenoid, and the worm as actuated by an electro-magnet, it will be understood that the electric energy may be utilized in either of these forms in either or both situations.

The system of levers from the magnet N to the pawl N^5 , for increasing the sweep of the latter, may be varied, as also may be the arrangement of contacts for the controller J .

I claim:—

1. In a loom of the character set forth, a warp-beam, a brake thereon, an electrically actuated releasing-means for said brake, a step by step let-off device, an electric circuit

in which said releasing-means is located, and a controller operated by a moving portion of the loom for making and breaking said circuit.

2. In a loom, a warp-beam, warp wires, a brake on said beam, means for holding said wires under tension, an electrically-actuated releasing-means for said brake, an electric circuit in which said releasing-means is located, and a step by step let-off device constructed to resist the tendency of said beam to rotate when said brake is released.

3. In a loom of the character set forth, a warp-beam, a brake thereon, an electrically actuated releasing-means for said brake, a feed-roller geared to said warp-beam, an electrically operated feeding device for said roller, an electric circuit in which said releasing-means and feeding device are located, and a controller for making and breaking such circuit.

4. In a loom of the character set forth, a warp-beam, a brake thereon, an electrically actuated releasing-means for said brake, a feed-roller geared to said warp-beam, an electrically operated feeding device for said roller, a shaft for operating the heddles, an electric circuit in which said releasing-means and feeding device are located and a controller operated by the revolutions of said shaft for making and breaking such circuit.

5. In a loom of the character set forth, a warp-beam, a feed-roller geared to said warp-beam, a worm-wheel on said roller, a worm in mesh with said worm-wheel, a ratchet-wheel on said worm, a pawl arranged to engage said ratchet-wheel, a lever in which said pawl is mounted, an electro-magnet for moving said lever, an electric circuit in which said electro-magnet is located and a controller operated by a moving portion of the loom for making and breaking such circuit.

6. In a loom of the character set forth, a warp-beam, a feed-roller geared to said warp-beam, a worm-wheel on said roller, a worm in mesh with said worm-wheel, a ratchet-wheel on said worm, a pawl arranged to engage said ratchet-wheel, a lever in which said pawl is mounted, an electro-magnet for moving said lever, an electric circuit in which said electro-magnet is located, a controller operated by a moving portion of the loom for making and breaking such circuit, and a stop for limiting the movement of said pawl.

In testimony that I claim the invention above set forth I affix my signature, in presence of two witnesses.

FRANK JOHNSON.

Witnesses:

CHARLES R. SEARLE,
F. E. ECCARDT.