

(No Model.)

2 Sheets—Sheet 1.

J. MAW.

POSITIVE SHUTTLE MOTION FOR LOOMS.

No. 377,207.

Patented Jan. 31, 1888.

Fig. 1.

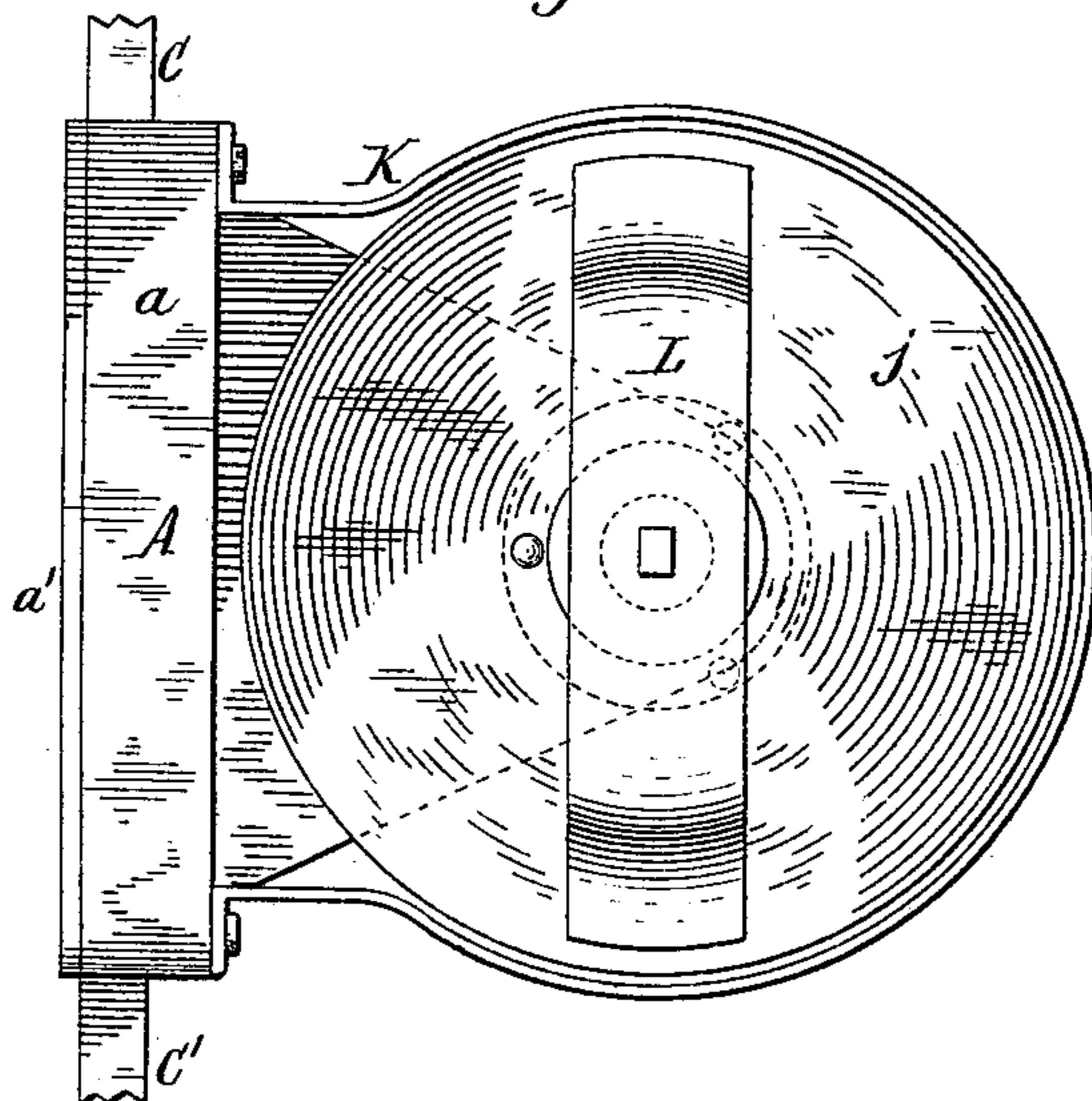


Fig. 2.

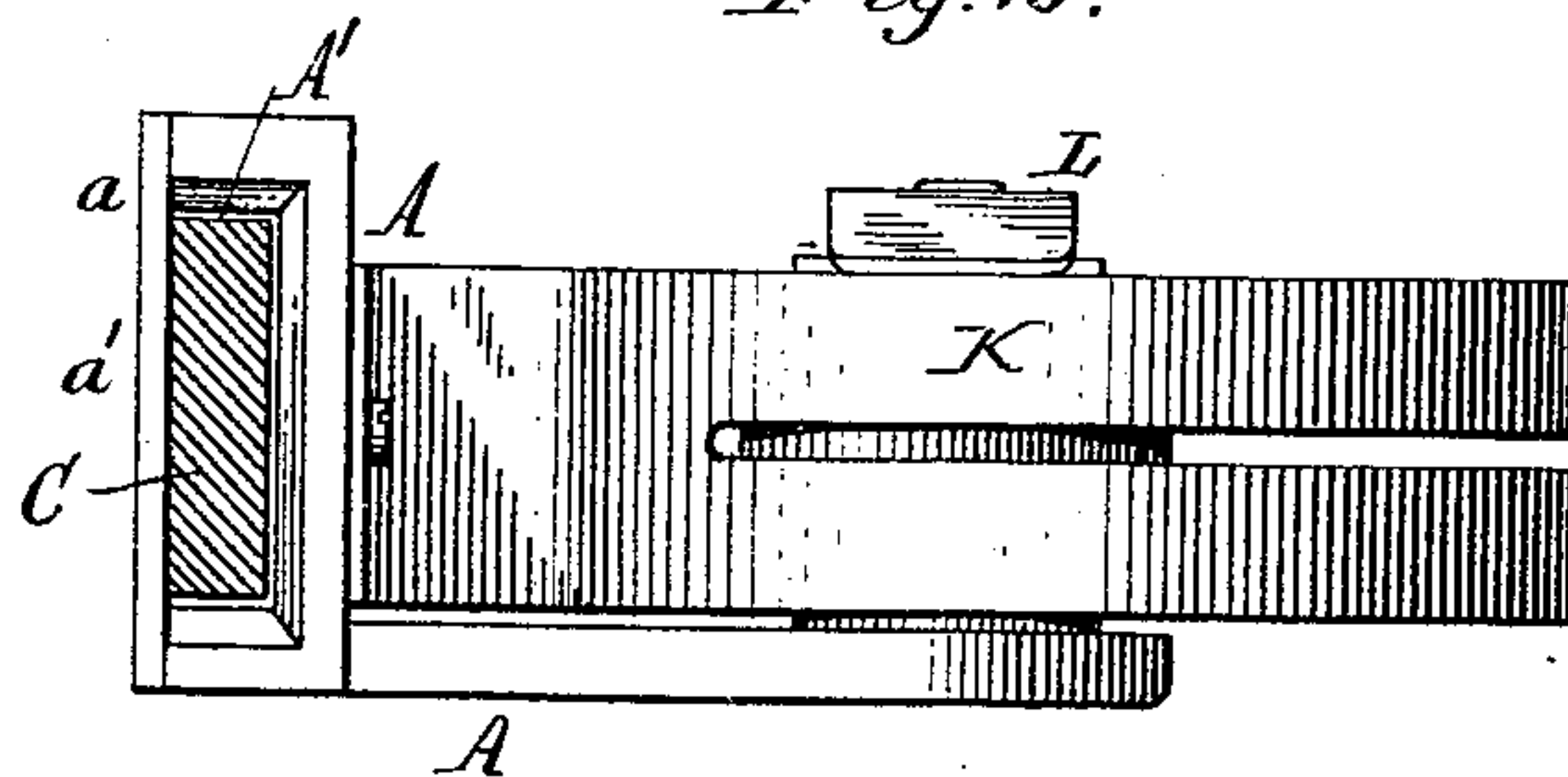
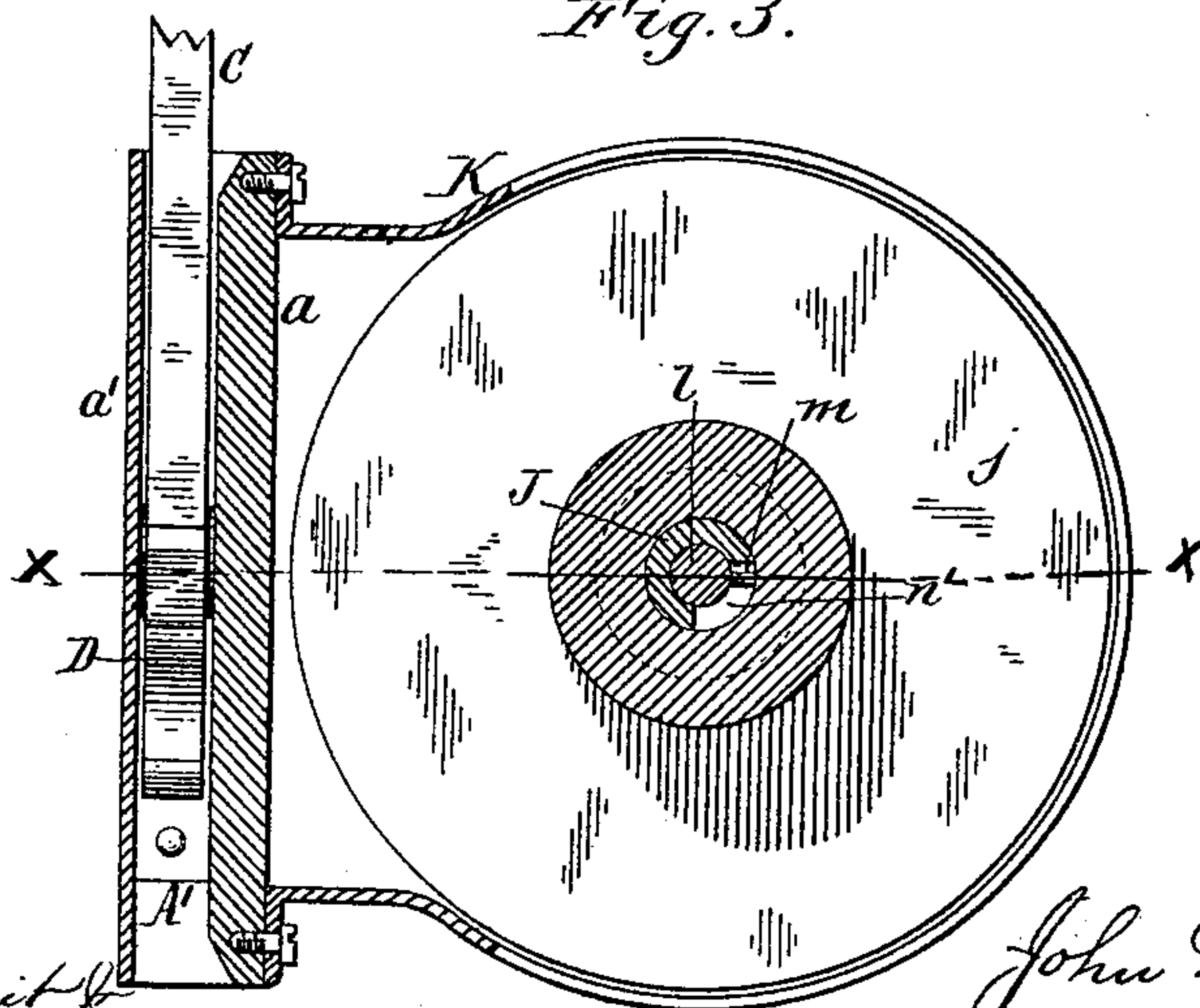


Fig. 3.



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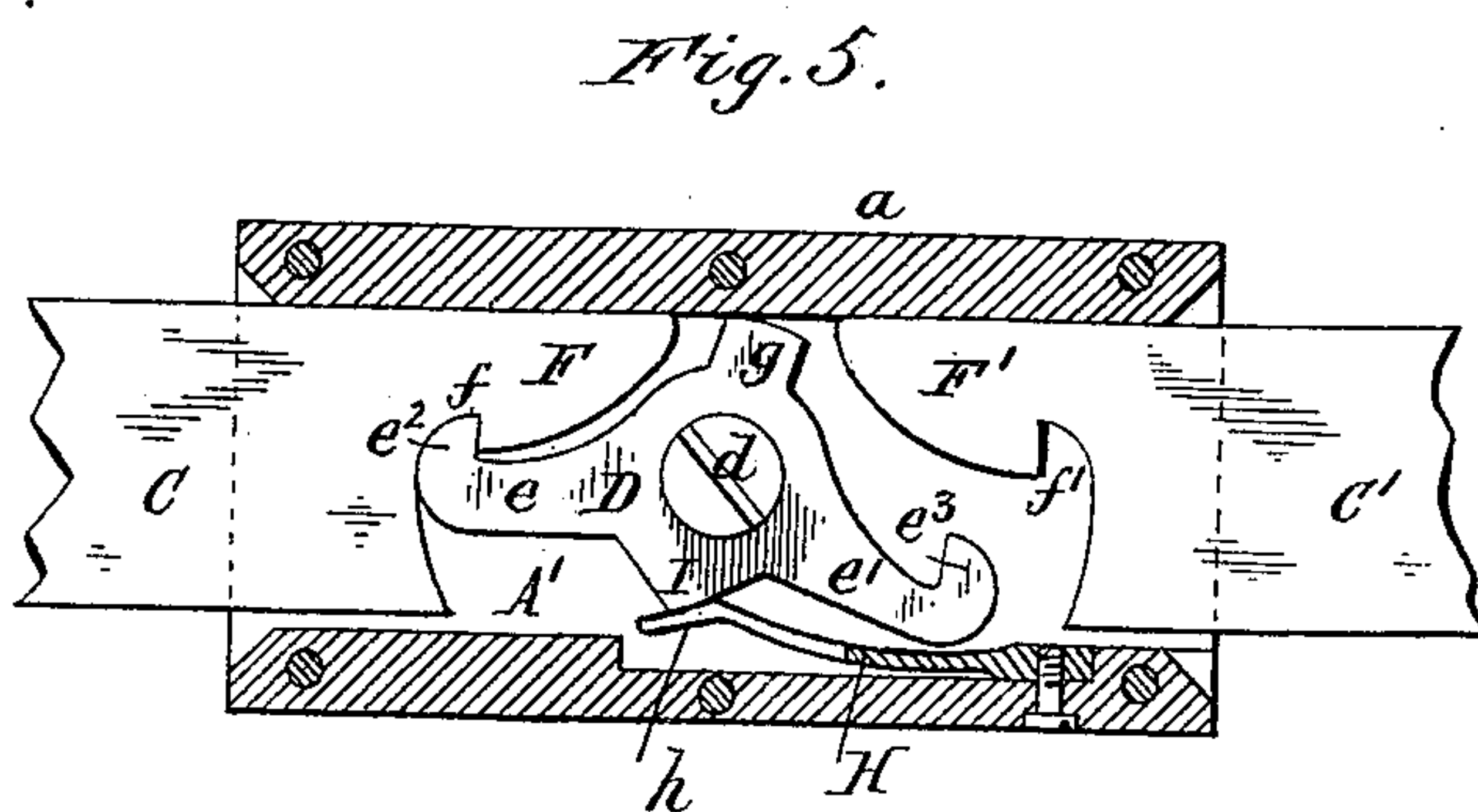
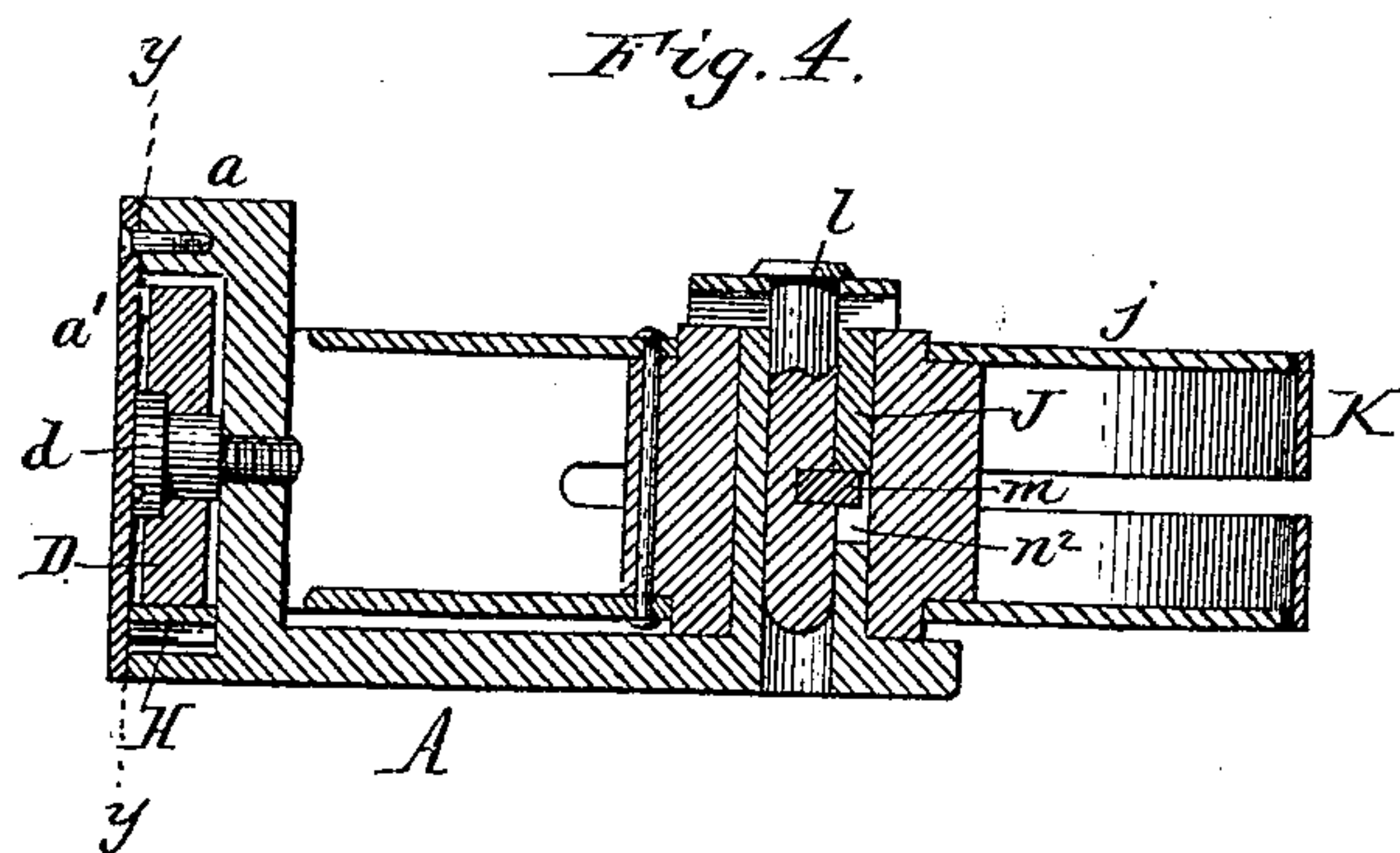


Fig. 7.

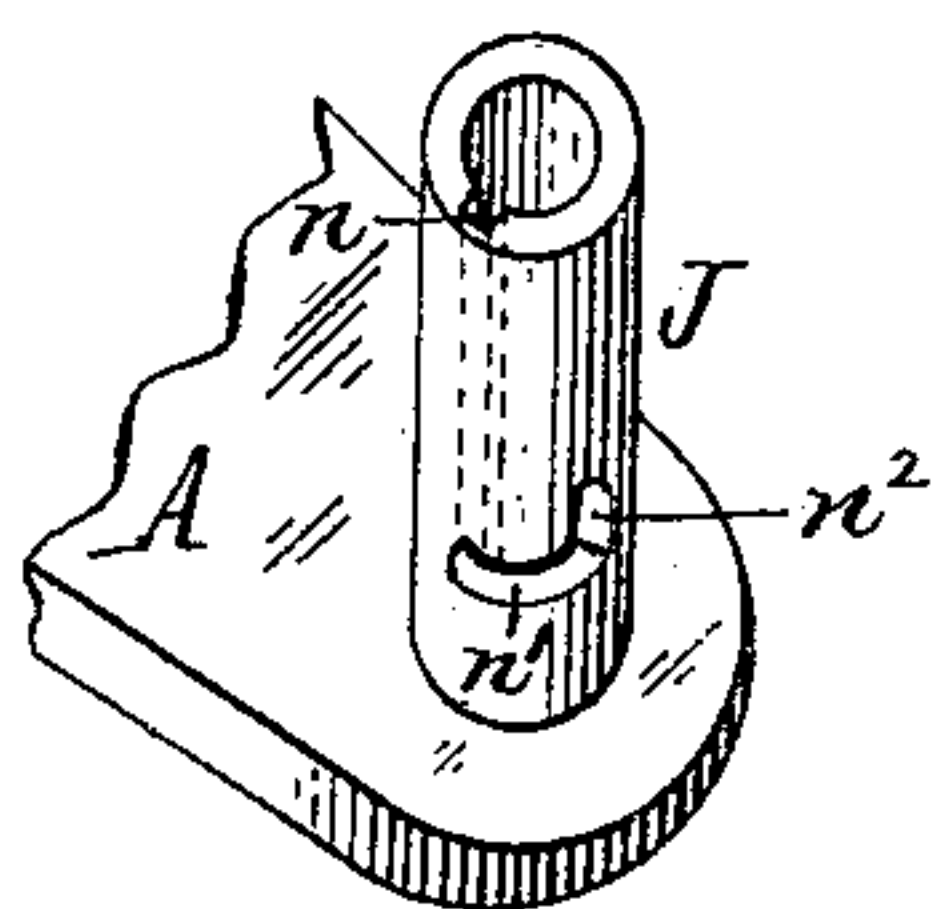
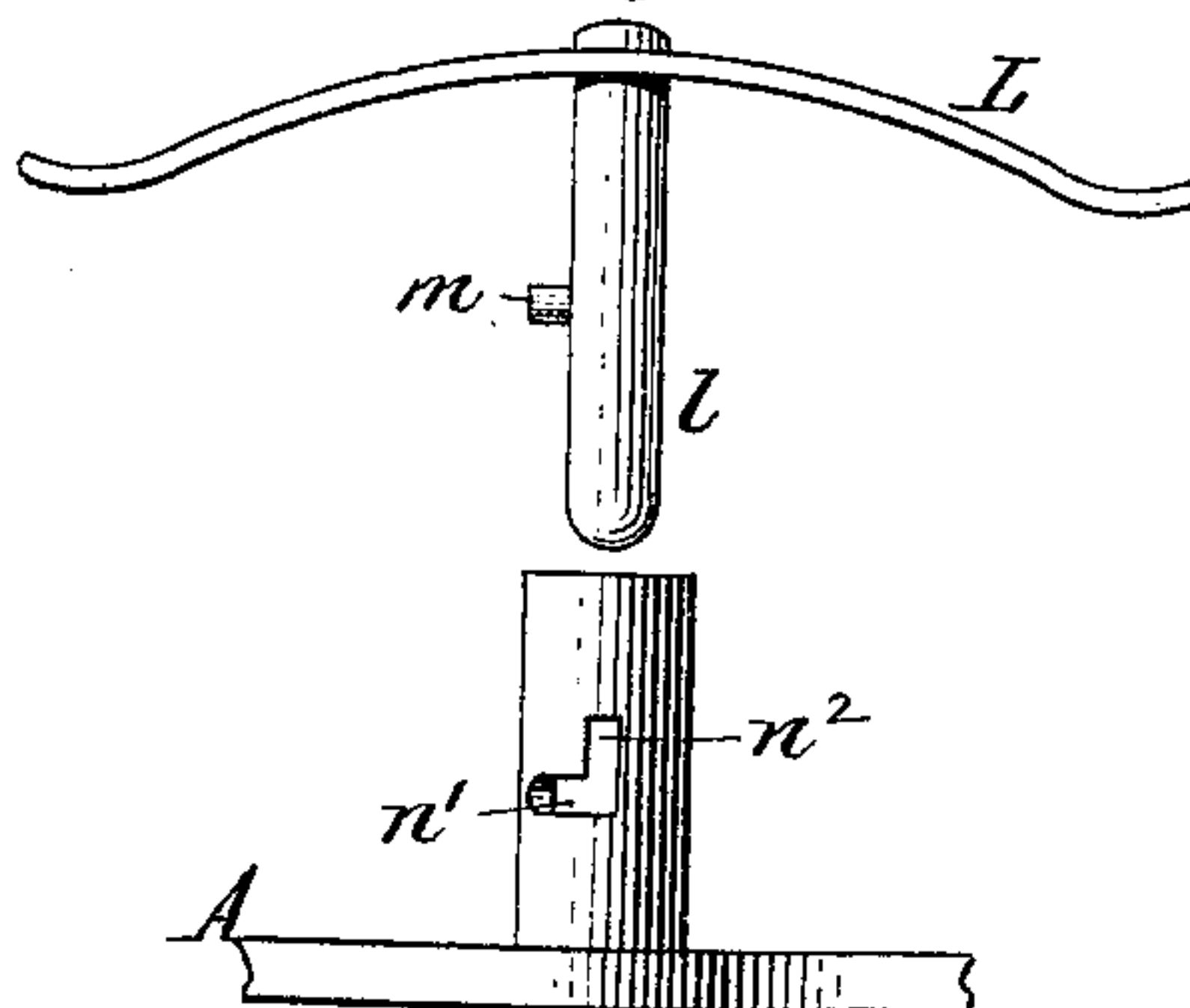


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN MAW, OF DUNDAS, ONTARIO, CANADA.

POSITIVE SHUTTLE-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 377,207, dated January 31, 1888.

Application filed May 19, 1887. Serial No. 238,730. (No model.)

To all whom it may concern:

Be it known that I, JOHN MAW, of Dundas, in the Province of Ontario and Dominion of Canada, have invented new and useful Improvements in Positive Shuttle-Motions for Looms, of which the following is a specification.

This invention relates to that class of shuttle-motions in which the shuttle is operated positively by two carrier-arms arranged on opposite sides of the loom and receiving and delivering the shuttle from one to the other within the warp-shed by an automatic locking and unlocking mechanism.

The object of my invention is the production of a simple and effective mechanism by which the shuttle is automatically attached to and disconnected from the carrier-arms; also, to provide the shuttle with a simple tension-spring which is easily applied and removed.

My invention consists of the improvements which will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of my improved shuttle and portions of the carrier-arms. Fig. 2 is a side elevation of the shuttle with one of the carrier-arms in section. Fig. 3 is a horizontal section of the same. Fig. 4 is a vertical sectional elevation in line *xx*, Fig. 3. Fig. 5 is a vertical section in line *yy*, Fig. 4. Fig. 6 is an elevation of the tension-spring detached from the bobbin-post and the bobbin-post. Fig. 7 is a perspective view of the bobbin-post.

Like letters of reference refer to like parts in the several figures.

A represents the frame of the shuttle, provided at one end with an elevated portion, *a*, which is grooved on its front side and closed by a front plate, *a'*, whereby a narrow chamber, *A'*, is formed at the front end of the shuttle. This chamber extends across the front of the shuttle and is open at both ends.

C C' represent the horizontal carrier-arms, which alternately enter the chamber *A'* from opposite sides and move simultaneously inwardly and outwardly in a well-known manner. Any suitable or well-known mechanism may be employed for imparting this motion to these arms—for instance, mechanism like that

described and shown in Letters Patent No. 299,610, June 3, 1884.

D represents a duplex locking lever or hook, pivoted vertically in the chamber *A'* of the shuttle by a horizontal bolt, *d*, and adapted to engage alternately with the inner ends of the carrier-arms C C' in such manner that when the lever becomes detached from one arm it engages with the other arm.

The lever D is provided with two arms, *e e'*, projecting in opposite directions from its fulcrum, and provided, respectively, with hook-shaped heads *e² e³*, which are adapted to engage in notches *f f'* in the carrier-arms C C'. The latter are provided with heads F F', which project forward beyond the notches *f f'*, and which are adapted to engage alternately against opposite sides of a tail-piece or projection, *g*, formed on the locking-lever D above the pivot thereof. The locking-lever is held in an inclined position by a spring, H, which is secured at one end to the bottom of the passage *A'*, and provided at its free end with an inclined or bent portion, *h*, engaging against one or the other side of a double-inclined or V-shaped projection, I, formed on the locking-lever D below the pivot thereof.

In the position of the parts represented in Fig. 5 the arm *e* of the locking-lever is engaged in the notch *f* of the carrier-arm C, and the shuttle is thereby connected to the latter and follows its movement.

Assuming that the carrier-arms are moving toward each other, the head F' of the carrier-arm C' will strike against the tail-piece *g* of the locking-lever, and thereby turn the latter in such a direction as to disengage the arm *e* from the notch *f* and swing the arm *e'* toward the notch *f'* of the arm C'. This turning movement of the lever D causes the double-inclined projection I to depress the free end of the spring H until the apex of the projection reaches the upper edge of the inclined end *h* of the spring. The shuttle is now detached from the carrier C and not yet connected with the carrier C', but it continues its motion toward the carrier C' by its own momentum and by the pushing of the carrier C. The distance through which the shuttle moves in this manner before it becomes connected with the carrier C' is short,

but sufficient to cause the locking-lever D to be turned farther by the carrier C' until the apex of the projection I passes beyond the upper edge of the inclined end *h* of the spring H. 5
 When this occurs, the spring presses against the opposite inclined face of the projection I, whereby the lever D is further turned in the same direction, so as to engage its arm *e'* with the notch *f'* of the carrier C'. The shuttle is 10
 now attached to the carrier C' and follows the movement of the latter. It will thus be seen that the lever D is unlocked from one carrier-arm by the head of the opposite carrier-arm striking against the tail-piece of the locking-lever, and that the shuttle is locked to the op- 15
 posite carrier-arm by the reversing-spring, which causes the locking-lever to complete its rocking movement.

J represents the upright hollow post upon 20
 which the hub of the bobbin *j* turns and which is secured to the shuttle-frame A.

K represents a curb or slotted guard which is secured with its front ends to the raised portion *a* of the shuttle-frame and which incloses 25
 the bobbin.

L represents the tension-spring which bears with its free ends against the upper side of the bobbin, and which is provided at its center with a pin, *l*, which enters the bore of the hol- 30
 low post, J.

m is a projection formed on the side of the pin *l*, and *nn'n²* is a groove formed in the post J for locking the pin *l* in the post J by means of the projection *m*. The outer or upper por- 35
 tion, *n*, of the groove is formed lengthwise in the bore of the hollow post J, and opens at the upper end thereof, as clearly represented in Fig. 7. The portion *n'* of the groove extends from the inner end of the groove *n* at right 40
 angles to the same, circumferentially of the post, and the portion *n²* extends from the end of the portion *n'* a short distance toward the upper end of the post. When the bobbin has been applied to the post J, the pin *l* is inserted 45
 into the bore of the post and the projection *m* is introduced into the portion *n* of the groove.

By compressing the spring L the pin *l* is forced into the bore of the post until the projection *m* reaches the inner end of the portion 50
n of the groove. A turning movement of the spring L and pin *l* now presses the projection *m* through the inner arc-shaped portion, *n'*, of the groove until the projection *m* reaches the portion *n²* of the groove, when the elasticity of 55
 the spring L causes the pin *l* to move upwardly in the bore of the post J until the projection *m* reaches the upper end of the portion *n²* of the groove, when the tension-spring is locked in

position. By effecting these movements in the inverse order the tension-spring is detached 60
 from the post. For facilitating the formation of the groove in the post J, the inner portions, *n'n²*, of the groove may extend to the outer surface of the post, as indicated clearly in Figs. 6 and 7. The projection *m* does not extend to 65
 the surface of the post, so that it cannot interfere with the free movement of the bobbin on the post.

My improved devices, whereby the tension-spring is attached to the shuttle-frame and the 70
 bobbin is held in place, are extremely simple in construction, easily manipulated, and all concealed within the shuttle, so that there are no projecting parts which could interfere with the wire or thread which is run off from the 75
 bobbin, nor are there any loose parts which are liable to be lost.

My improved shuttle-operating mechanism is particularly desirable for looms which are used in the manufacture of wire-cloth. 80

I claim as my invention—

1. The combination, with the shuttle-frame, of a duplex locking-lever pivoted to said frame and adapted to come in contact with the carrier-arms, thereby effecting the first part of the 85
 movement of the locking-lever, and a reversing-spring attached to the shuttle-frame and completing the movement of the locking-lever, substantially as set forth.

2. The combination, with the carrying-arms 90
 C C', provided with locking-recesses *ff'* and heads F F', of a shuttle provided with a duplex locking-lever, D, having heads *e²e³*, a tail-piece, *g*, and a projection, I, and a reversing-spring, H, bearing against the projection I, substan- 95
 tially as set forth.

3. The combination, with the shuttle-frame provided with a hollow post, J, of a bobbin mounted on said post, and a tension spring, L, provided with a pin, *l*, which enters the bore 100
 of the hollow post, and means whereby the pin *l* is locked within the same, substantially as set forth.

4. The combination, with the shuttle-frame provided with a hollow post, J, having a lock- 105
 ing-groove, *nn'n²*, of a bobbin mounted on said post, a tension-spring, L, and a pin, *l*, secured to said spring and provided with a projection, *m*, whereby the pin is locked in the groove of the post, substantially as set forth. 110

Witness my hand this 7th day of May, 1887.

JOHN MAW.

Witnesses:

T. A. WARDELL,
 H. A. WARDELL.