

No. 688,054.

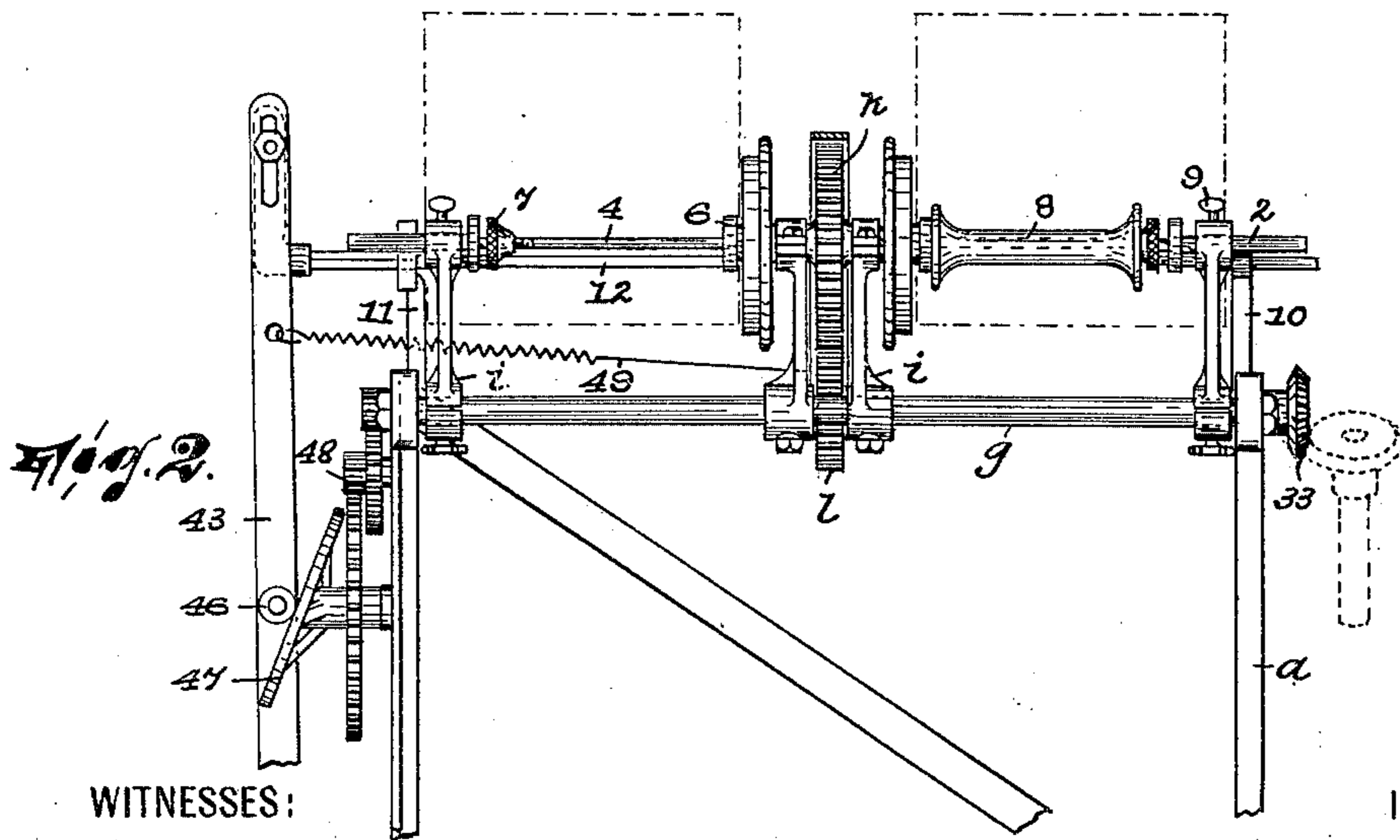
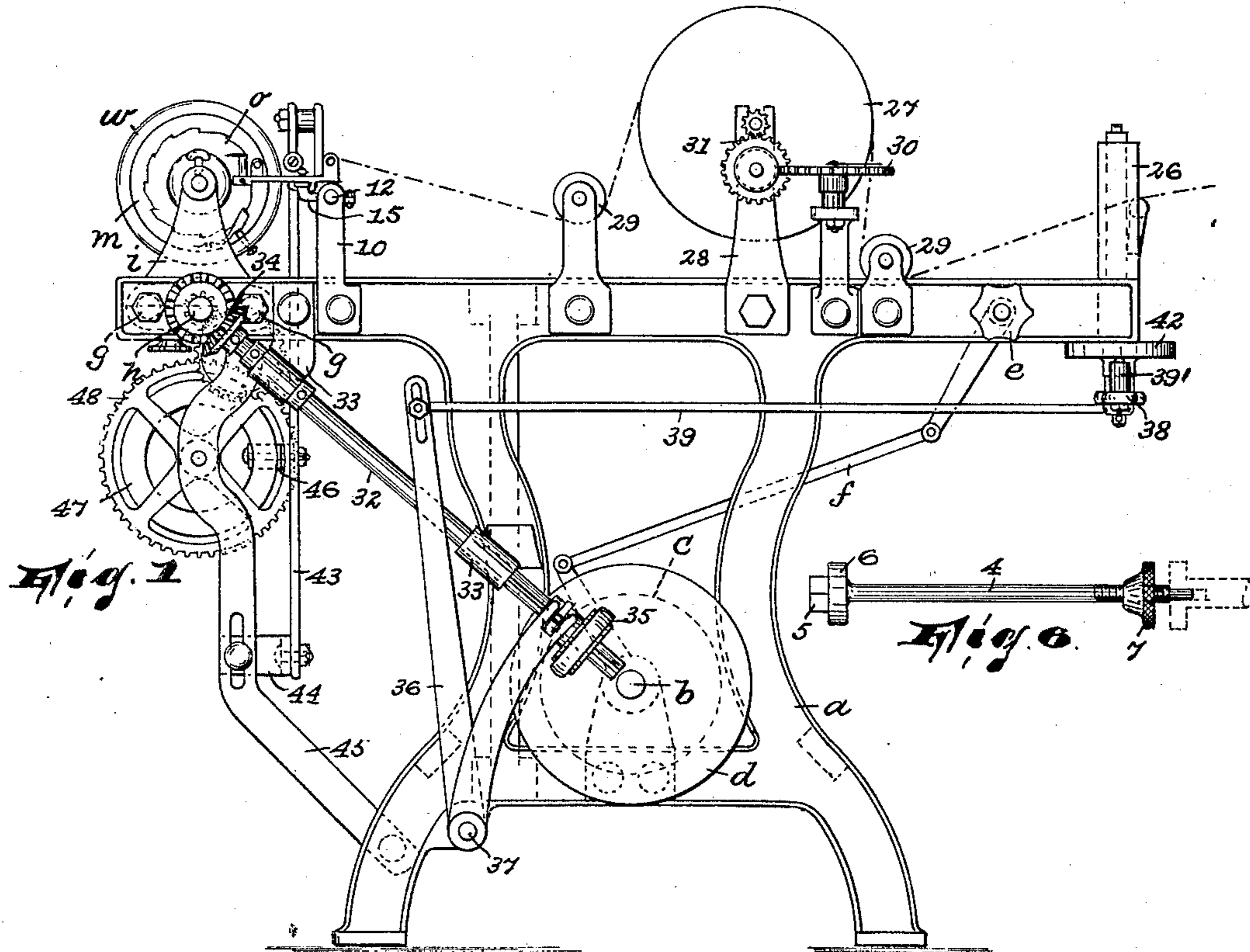
Patented Dec. 3, 1901.

F. L. ATHERTON.  
WARPING MACHINE.

(Application filed May 1, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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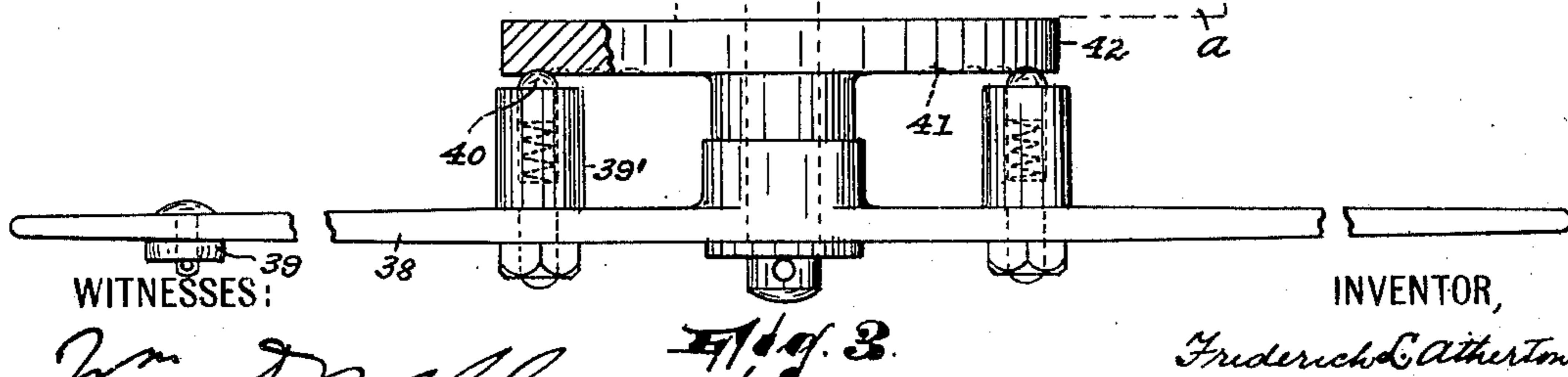
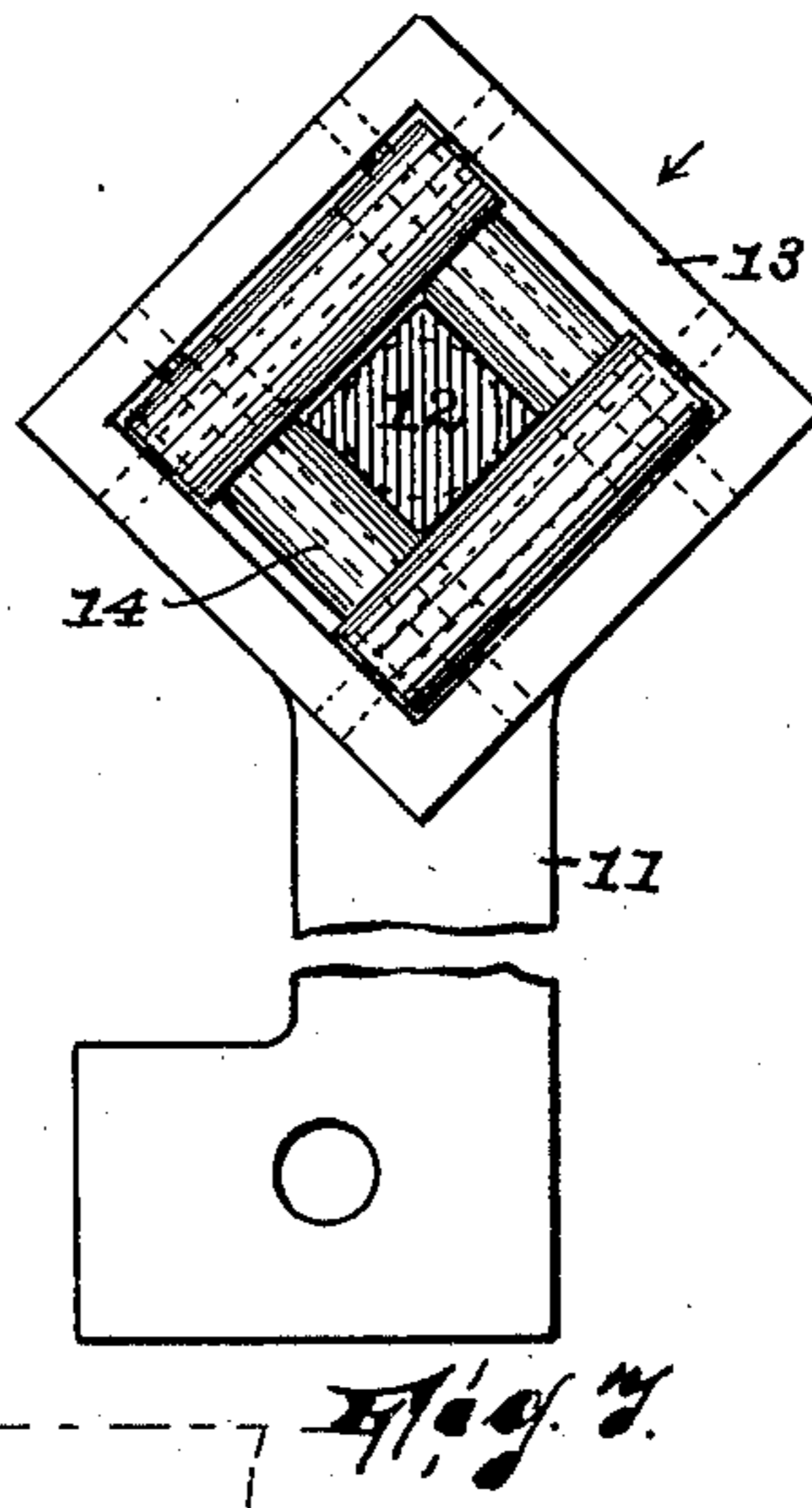
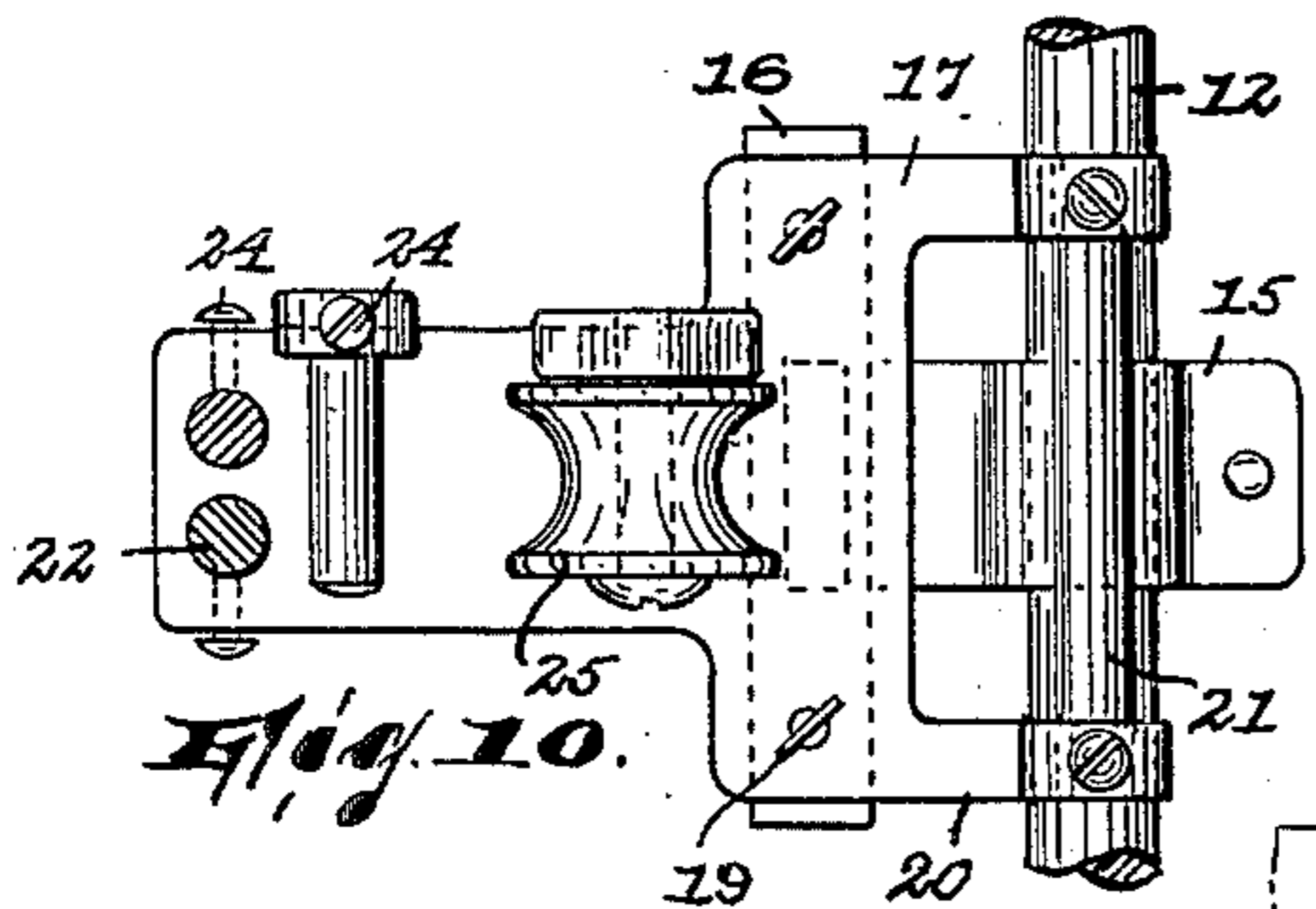
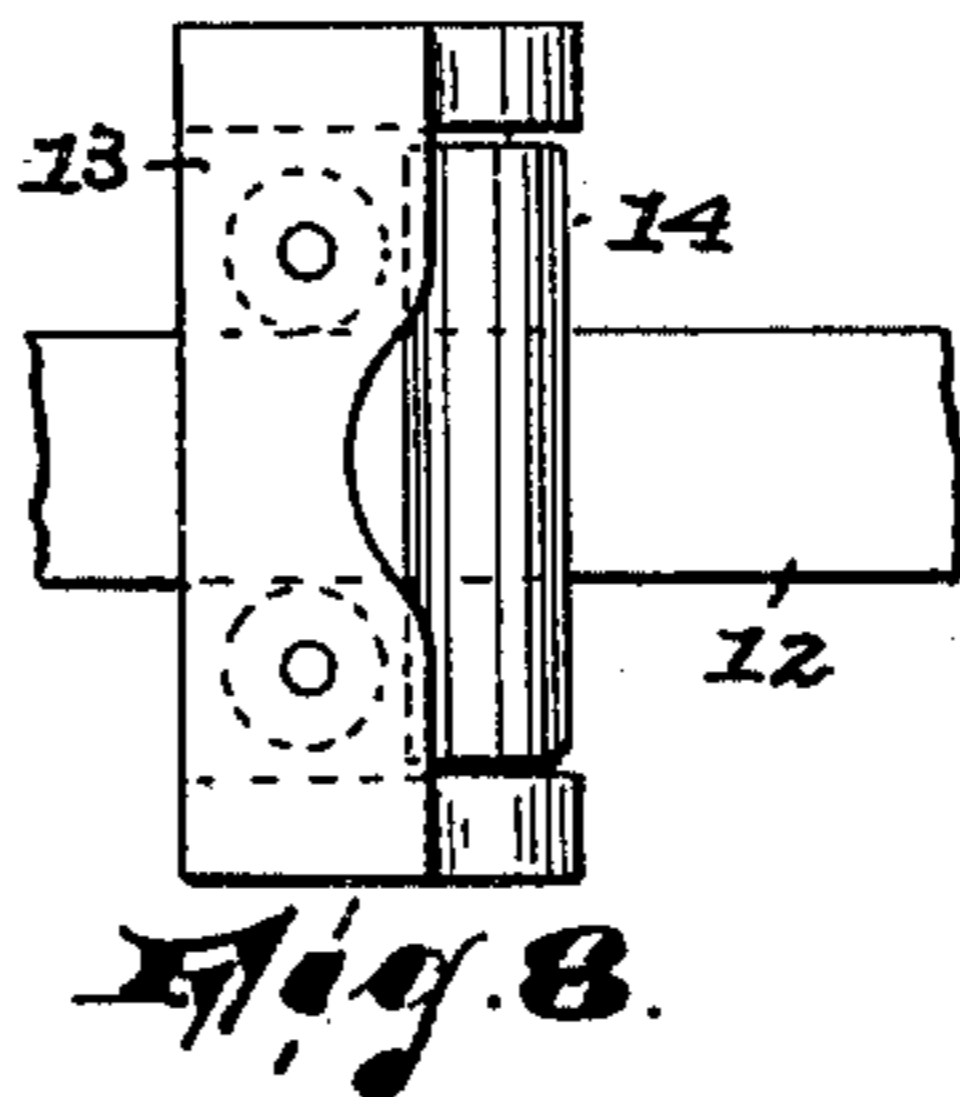
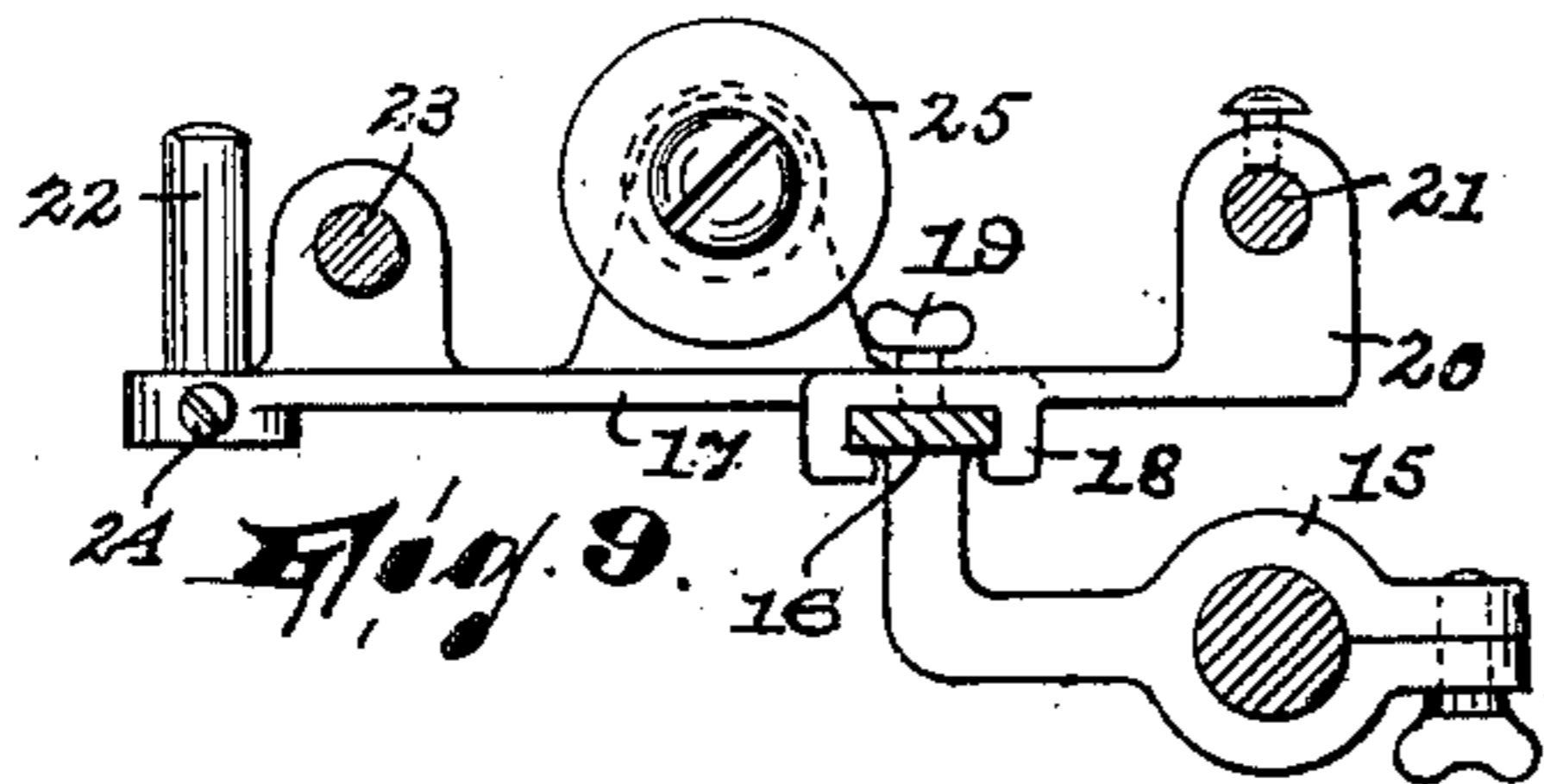
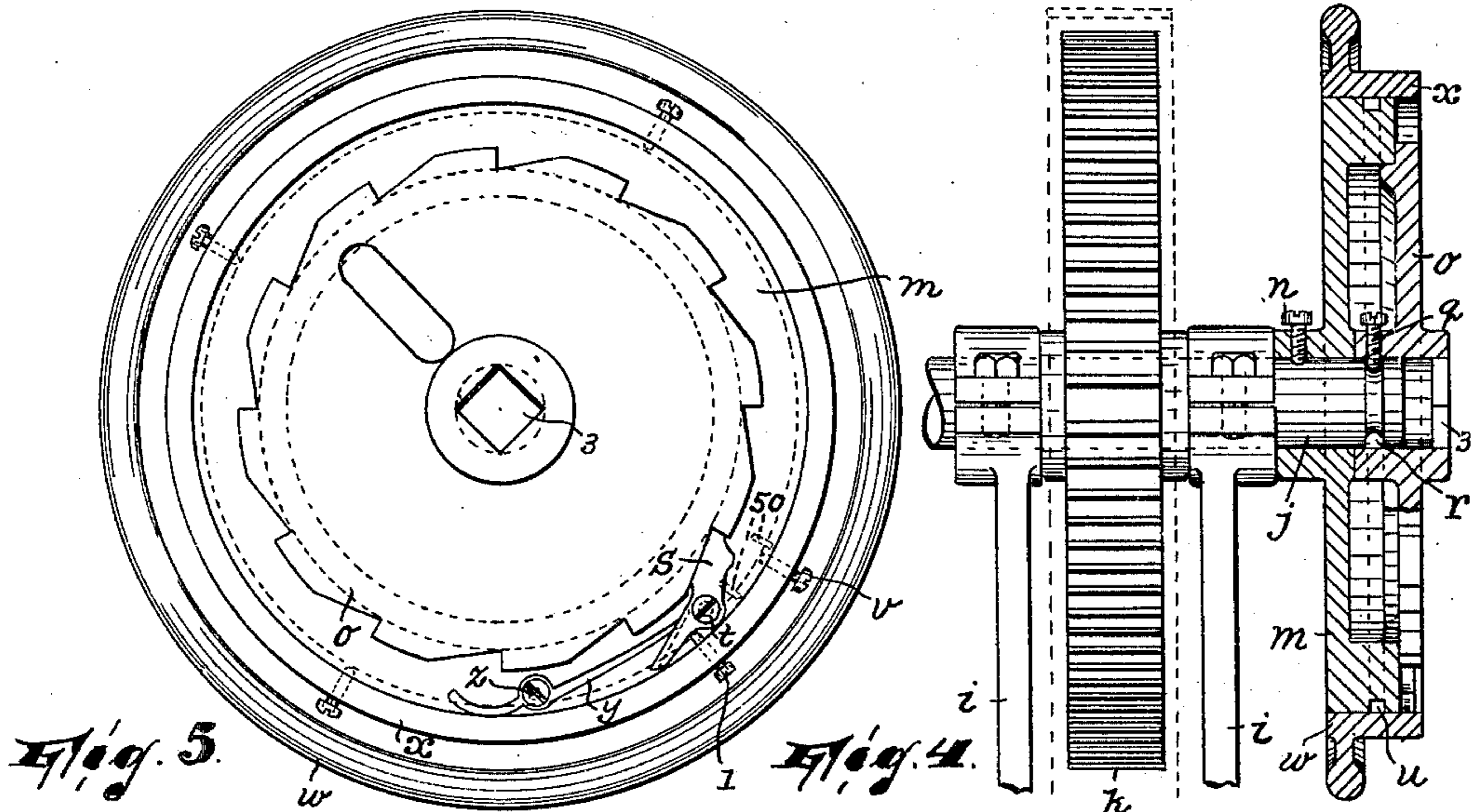
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(No Model.)

2 Sheets—Sheet 2.



WITNESSES:

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Fig. 3.

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# UNITED STATES PATENT OFFICE.

FREDERICK L. ATHERTON, OF PATERSON, NEW JERSEY.

## WARPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 688,054, dated December 3, 1901.

Application filed May 1, 1901. Serial No. 58,253. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK L. ATHERTON, a citizen of the United States, residing in Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Warping-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to warping-machines, and it has reference particularly to the class of machines of this nature known as "direct or horizontal" warping-machines.

The invention consists in a warping-machine and its several combinations or groups of elements constructed substantially as will be hereinafter described, and finally embodied in the clauses of the claim.

Referring to the accompanying drawings, wherein corresponding characters of reference indicate like parts in the several views, Figure 1 is a view in side elevation of my improved warping-machine. Fig. 2 is an end view of the upper portion of the machine. Fig. 3 shows a certain lever whereby the speed at which the warp-receiving bobbins rotate may be manually adjusted. Figs. 4 and 5 are respectively a front view and a side view of a part of the bobbin-driving means. Fig. 6 shows one of the bobbin-carrying spindles or mandrels. Figs. 7 and 8 are respectively a front view and a plan view, looking in the direction of the arrow in Fig. 7, of a mounting for a certain traverse-rail; and Figs. 9 and 10 are respectively a side view and a plan view of one of the thread-guides on said traverse-rail.

*a* in said drawings designates the frame of the machine, and *b* designates the main drive-shaft journaled in said frame and carrying at one end a drive-pulley *c* and at the other end a friction-disk *d*. A clutch mechanism (not shown) is, as usual, made use of for connecting the pulley *c* with the shaft, said clutch mechanism being manually operative from a hand-wheel *e* through a train of levers *f*.

One end of the machine is traversed by a

pair of parallel stationary shafts *g* and a rotary shaft *h*, the latter being disposed between the other two. On the shafts *g* are adj- 55  
justably secured pairs of brackets *i*. The adjacent brackets in the pairs afford journaling means for a shaft *j*, which carries a gear *k*, fixed thereon. This gear *k* is driven from the shaft *h* through the medium of a pinion *l*, with which it meshes. The ends of the shaft protrude through the brackets *i*, and they carry face-plates *m*, which are secured to them for rotation therewith by set-screws *n*. Outside of the face-plates *m* are mounted 65  
on the shaft *j*, so as to turn freely thereon, ratchet-wheels *o*. These ratchet-wheels are prevented from lateral displacement by set-screws *q*, which they carry and whose ends work in annular grooves *r* in the ends of the 70  
shaft. Each face-plate carries on its outer face and near its periphery a pawl *s*, pivoted on a screw *t*. The face-plate *m* is provided with an annular or circumferential groove *u*, in which work screws *v*, which hold in place 75  
a flanged hand-wheel *w*, which surrounds the face-plate. The pawl *s*, which is, as will be seen in Fig. 5, disposed between the periphery of the ratchet-wheel and the flange *x* on the hand-wheel, is normally held with its 80  
point in engagement with the ratchet-wheel by a spring *y*, which bears against the inner free end of the pawl at one end and against the flange *x* at its other end, being pivoted at *z* on the face-plate. The flange of the hand- 85  
wheel carries a set-screw or other projection 1, which when the hand-wheel is turned acts to press inwardly the pawl *s*, so as to disengage it from the ratchet-wheel and permit said ratchet-wheel to rotate independently of 90  
the face-plate.

In the outer bracket of each pair of brackets is journaled a tail-stock 2, between which and the adjoining ratchet-wheel, the adjacent portion of whose bore is squared or otherwise 95  
non-circular, as at 3, a spindle or mandrel 4 is arranged. The inner end of the mandrel is squared, as at 5, to fit the squared opening 3 of the ratchet, and it is provided with an integral bushing 6 and an adjustable bushing 100  
7, which latter is screwed onto the spindle at its outer end. Each spindle is adapted to carry a bobbin or spool 8, which may be securely clamped thereon between the bush-

ings after having first removed the bushing 7 and withdrawn the spindle from its mountings in the ratchet-wheel and the tail-stock, which latter, it should be remarked, is adjustably secured in place in the bracket *i* by means of a set-screw 9.

To the sides of the frame and just back of the brackets *i* are secured other brackets 10 11, in which is mounted the traverse-rail 12. The bracket 11 is shown in Figs. 7 and 8, and its upper end consists of a rectangular open head 13, in which is journaled in rectangular disposition a set of rollers 14. The portion of the traverse-rail which works in the bracket 15 11 is squared, fitting, approximately, the opening formed between the rollers 14, (see Fig. 7,) which thus afford an antifriction-bearing therefor.

On the traverse-rail are mounted adjustable clamps 15. Each clamp carries a substantially horizontal plate 16, on which rests a bracket 17, having its under face formed with guides 18, receiving the plate 16, and also having adjusting-screws 19, which take 25 against the plate to secure the bracket thereto.

In arms 20 at one end of the bracket is mounted a glass rod 21, and at the other end of the bracket are a pair of vertical guides 22 and a horizontal guide 23, the same being secured for longitudinal adjustment by set-screws 24. Between the glass rod 21 and the guides is journaled a rotary peripherally-grooved guide 25.

26 denotes the usual reed for the machine, 35 and 27 the usual beam, which is journaled in brackets 28 between the reed and the bobbin-driving mechanism. The beam 27 is duplicated, there being one for each bobbin 8.

29 denotes rollers which are arranged approximately in the plane of the bottom of the beams 27. Each beam is provided with a measuring device 30, connected with the beam by suitable gearing 31. The goods after passing through the reed 26 extend under the adjacent roller 29, then over the beam 27, then under the other roller 29, then over the glass bar 21 of each thread-guiding device on the traverse-rail, then under the rotary guide 25 of said device, then over the guide 23, and 50 between the guides 22 onto the corresponding bobbin 8.

The shaft *h* is driven from a shaft 32, which is journaled in brackets 33 and which is connected with the shaft *h* through bevel-gearing 34. On the shaft 32 is keyed a friction-wheel 35, which is rendered adjustable longitudinally thereon by a bell-crank lever 36, which is fulcrumed at 37 in the frame and has its upper end connected with one end of 60 a lever 38 by a connecting-rod 39. The lever 38 carries sockets 39', from the ends of which protrude spring-actuated buttons or pawls 40, having their ends rounded and adapted to seat in recesses 41, formed in the face of a disk 42, which is secured to the frame *a*, concentrically with the lever 38.

By adjusting the friction-wheel 35 from the

lever 38 from time to time the tendency of the beam of the warping-machine to draw with increasing tension on the threads as the material is wound in a constantly-augmented layer may be compensated for.

The traverse-rail 12 is reciprocated by means of a lever 43, to which it is adjustably connected and which is fulcrumed in a bracket 44, adjustably secured in a stand 45, carried by the frame. This lever carries a roller 46, which bears against a cam 47, journaled in the stand 45 and connected with the shaft *h* through suitable gearing 48. The lever is normally held in against the cam by a spring 49, connecting it with the frame.

It will be understood that by manipulating the hand-wheel *w* so as to throw the pawl out of connection with the ratchet the ratchet-wheel is free to rotate independently of the face-plate. Thus if it is desired to reverse the operation of the machine for any purpose, such as to attend to a broken thread, the bobbins may be disconnected from the driving means to permit the backward rotation. In order to limit the movement of the hand-wheel, lugs 50, arranged in the groove *u* of each face-plate *m*, are provided, one on each side of one of the set-screws *v*.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a warping-machine, the combination, with the frame, of a rotary shaft journaled in said frame, means for rotating said shaft, rotary members arranged on said shaft, the one rigidly and the other loosely, a spring-actuated pawl carried by one of said members, the other of said members having ratchet-teeth engaged by said pawl, a spindle connected to the loose member and journaled in the frame, and a hand-wheel surrounding said members and having a projection movable into engagement with said pawl, substantially as described.

2. In a warping-machine, the combination, with the frame, of a rotary shaft journaled in said frame, means for rotating said shaft, a face-plate secured on said shaft, a ratchet-wheel revolubly arranged on said shaft, a spindle connected to said ratchet-wheel and journaled in said frame, said spindle being adapted to carry the bobbin or other warp-holder, a spring-actuated pawl carried by the face-plate and normally engaging the ratchet, and a hand-wheel carried by said face-plate and having a projection movable into engagement with said pawl, substantially as described.

3. In a warping-machine, the combination, with the frame, of a rotary shaft journaled in said frame, means for rotating said shaft, a face-plate secured on said shaft, a ratchet-wheel revolubly arranged on said shaft, a spindle detachably connected with said ratchet-wheel and adapted to receive a bobbin or other warp-holder, an adjustable tail-stock journaled in said frame and receiving

the free end of the spindle, a spring-actuated pawl carried by the face-plate and normally engaging the ratchet, and a hand-wheel carried by said face-plate and having a projection movable into engagement with said pawl, substantially as described.

4. In a thread-guiding mechanism for warping-machines, the combination of a clamp having an integral plate, a bracket adjustably secured on said plate and having parallel guides receiving the same, a pair of substantially parallel and vertical thread-guides secured on said bracket, another and horizontal thread-guide secured on said bracket,

a horizontal glass rod arranged parallel to said last-named thread-guide, and a rotary peripherally-grooved thread-guide arranged on said bracket between the glass rod and the other thread-guides, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 23d day of April, 1901.

FREDERICK L. ATHERTON.

Witnesses:

JOHN W. STEWARD,  
ROBERT J. POLLITT.