

No. 688,656.

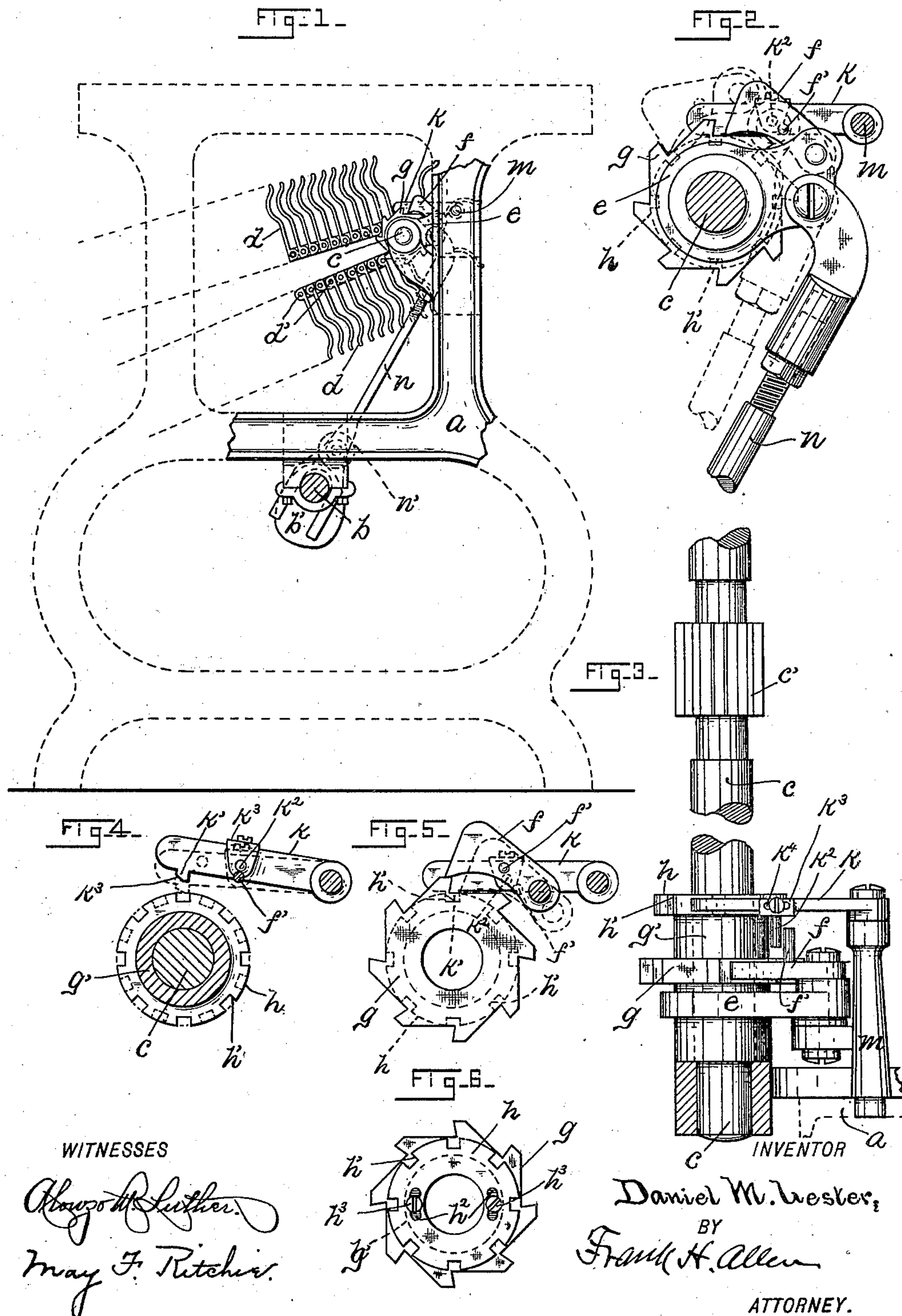
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D. M. LESTER.

MECHANISM FOR ROTATING AND LOCKING SHAFTS.

(Application filed Jan. 8, 1900.)

(No Model.)



UNITED STATES PATENT OFFICE.

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MECHANISM FOR ROTATING AND LOCKING SHAFTS.

SPECIFICATION forming part of Letters Patent No. 688,656, dated December 10, 1901.

Application filed January 8, 1900. Serial No. 688. (No model.)

To all whom it may concern:

Be it known that I, DANIEL M. LESTER, a citizen of the United States, residing at Norwich, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Mechanism for Rotating and Locking Shafts, of which the following is a full, clear, and exact description.

10 This invention is in envelop machinery of the class that includes an endless-chain drier; and my purpose is to provide simple but positively-acting mechanism for driving the actuating-shaft of such a drier with an intermittent rotary motion and for locking the said shaft against rotation during the desired periods of rest. Machines of this class are operated at a high rate of speed, and the drier-chain must therefore be fed forward and 20 stopped one hundred or more times per minute, and unless positively controlled the momentum of the heavy moving body tends to carry the chain past the proper stopping-point, thus preventing the folded envelops from dropping into the pockets between the 25 "fingers" of the chain.

To assist in explaining my invention, I have provided the accompanying sheet of drawings, illustrating the same, as follows:

30 Figure 1 shows in elevation and principally in dotted lines one of the side frames of an envelop-machine having a portion of the chain drier in position therein and having my newly-invented mechanism properly applied thereto. Figs. 2 and 3 show my newly-invented mechanism detached in elevation and plan views, respectively, and on a somewhat-enlarged scale. Figs. 4 and 5 illustrate in elevation certain elements of said mechanism and the manner in which they operate. 40 Fig. 6 illustrates a certain detail of construction.

Referring to the drawings, the letter *a* denotes the side frame of an envelop-machine, 45 *b* the initial driving-shaft thereof, and *c* the above-mentioned chain-drier shaft, which latter, as well as the main shaft, is supported in suitable bearings in the frames. The letter *d* denotes as a whole the said chain drier, 50 which drier is made up of a number of frames or fingers hinged together by the wire pin-tles *d'*. The shaft *c* bears thereon a sprocket-

wheel *c'*, which is engaged and partially encircled by the drier-chain, the hinge-pins *d'* of the chain being received between the teeth 55 of said sprocket when the latter is in motion; but inasmuch as the general construction and operation of this feature of envelop-machines is well understood no detailed illustration or description of the same is now deemed necessary. 60

Loosely mounted upon the shaft *c* is a rocker-plate *e*, having a pawl *f* pivotally secured to one side thereof and adapted to engage with its free end the teeth of a ratchet-wheel *g*, fixedly mounted upon the shaft *c*. 65 The ratchet-wheel *g* is provided with a hub *g'*, to one end of which is secured a wheel *h*, having a notched periphery, the said notches being denoted by the letter *h'* and corresponding in number with the teeth of the ratchet-wheel *g*. The notched wheel *h* is adapted to be engaged by an arm *k*, the free end of which bears a projection *k'*, which under certain conditions registers with the notches *h'*, as 70 is hereinafter described. The arm *k* may be pivotally secured to any suitable fixed portion of the machine, or, as shown in the drawings, it may be mounted on a stud *m*, projecting from the frame *a*, and so as to support the said arm *k*. The pawl *f* and arm *k* have located in their confronting faces pins *f'* *k'*, respectively, which pins extend parallel with and overlap each other and under certain conditions are adapted to engage each 85 other. 80

The reference-letter *n* denotes a link one end of which is pivotally secured to the rocker-plate *e* and whose other end engages suitable mechanism whereby the plate *e* is rocked 90 upon the shaft *c* to cause the pawl *f* to operate with the ratchet-wheel *g*. I do not wish to confine myself to any particular mechanism for rocking the plate *e*, as it will be apparent that connections could be made between said plate and any suitable moving element of the machine; but in the drawings I have shown the following-described mechanism: The lower end of the link end is bifurcated, so as to straddle the main shaft *b*, and 100 near said lower end a roll *n'* is secured thereto, which roll is adapted to ride upon the periphery of a cam *b'*, mounted upon the shaft *b*, the rotation of the said cam serving, through

the roll n' , to drive the link n with a reciprocating motion, and thus rock the plate e . When the various elements of the shaft-actuating mechanism are in the positions shown by full lines in Fig. 2, (which positions, it is assumed, are their normal or starting positions,) it will be seen that the free end of the pawl f lies somewhat in the rear of the ratchet-tooth, which it will engage upon the forward movement of the said pawl, and it will also be seen that the projection k' of the arm k is in one of the notches h' of the notched wheel h , thus locking the latter and the shaft c against rotation. Upon the rocking of the plate e the pawl f is carried forward, and its pin f' , which lies in the rear of and somewhat lower than the pin k^2 of the arm k , is brought into engagement with the last-named pin and seeks to pass beneath it. As the forward movement of the pawl f continues the pin f' engages the pin k^2 , forcing the latter and the arm k upward until the portion k' of said arm becomes disengaged from the notch h' of the wheel h , as shown in dotted lines in Fig. 4. When the parts have assumed the last-named positions, the shaft c may be freely rotated, and such positions are assumed substantially simultaneously with the engagement of the pawl with the ratchet-teeth, after which the continued forward movement of the pawl f serves to rotate the said ratchet-wheel and shaft. When the pawl f in its forward movement has traveled sufficiently to cause the pin f' to move beyond the pin k^2 , the latter and the arm k at once drop by gravity until the projection k' engages the periphery of the wheel h and rides thereupon until the next succeeding notch h' travels into coincidence therewith, when the projection at once drops into said notch to again effect the locking of the wheel h . The last-described action of the arm k occurs just as the pawl f completes its forward movement, the various elements being then in their respective positions shown in Fig. 2 by dotted lines. Upon the return movement of the plate e the pawl f rides idly over the ratchet-teeth and the pin f' passes over and out of contact with the pin k^2 , as shown in Fig. 5, said pin f' dropping in the rear of and somewhat below the pin k^2 when the pawl finally reaches its starting position, as shown in Fig. 2 and in dotted lines in Fig. 5.

To enable a fine "timing" of the coaction of the pins f' and k^2 , one or both of the same may be adjustably secured in position. In the drawings the pin k^2 is shown as thus secured to the arm k , the said pin being mounted upon a plate k^3 , which latter is secured to the arm by a screw passing through a slot k^4 in said plate, thus permitting an adjustment of the plate and pin within the limits of the said slot. I also by preference adjustably secure the notched wheel h to the hub g' of the ratchet-wheel g to permit of a very fine

adjustment of the notches h' relatively to the ratchet-teeth. To accomplish the result just mentioned, the wheel h has located therein, on opposite sides and concentric with its center, slots h^2 for the reception of screws h^3 , by means of which the wheel is secured to the hub g' , thus permitting a rotary adjustment of the wheel h within the limits of the slots h^2 .

To guard against any possibility of the notches h' being carried past the arm projection k' by momentum, I preferably bevel the forward corner of the lower face of said projection, as at k^3 , to allow the arm to drop slightly before a notch h' becomes fully coincident with the projection k' , thus preventing the said notch from passing the projection.

It will be seen that my newly-invented mechanism acts positively to rotate a shaft with an intermittent motion and also to lock the same against accidental rotation during the intervals of rest between its movements, said locking mechanism doing away entirely with power-consuming drags now often provided, which drags are more or less uncertain in their action, and it will also be seen that my newly-invented mechanism may be very cheaply produced and may be applied in many instances to machines already built without requiring material changes in such machines.

Having thus described my invention, I claim—

1. The combination of a revoluble shaft, a sleeve thereon provided with a ratchet-disk and a notched disk spaced from each other, a stop-lever and a pawl pivotally mounted and coacting respectively with the notched disk and the ratchet-disk and disposed parallel with each other, and laterally-extending pins or projections carried by said pawl and lever, the projection of the stop-lever being disposed in the path of the projection of the pawl, substantially as described.

2. In combination with a revoluble shaft, mechanism for revolving said shaft with a step-by-step movement consisting of a pawl and ratchet, means for stopping and locking said shaft consisting of a notched disk and a coacting stop-lever, a laterally-extending projection carried by said lever, a laterally-extending projection carried by the pawl adapted to engage said projection of the lever and effect the disengagement of the latter from the notched disk, and means for effecting the adjustment of one of said projections relatively to the other, substantially as described.

Signed at Norwich, Connecticut, this 18th day of December, 1899.

DANIEL M. LESTER.

Witnesses:

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FRANK H. ALLEN.