Sept. 28, 1937. C. E. SIMPSON 2,094,026

LINK LOADING MACHINE

Filed Aug. 31, 1934 3 Sheets-Sheet 1

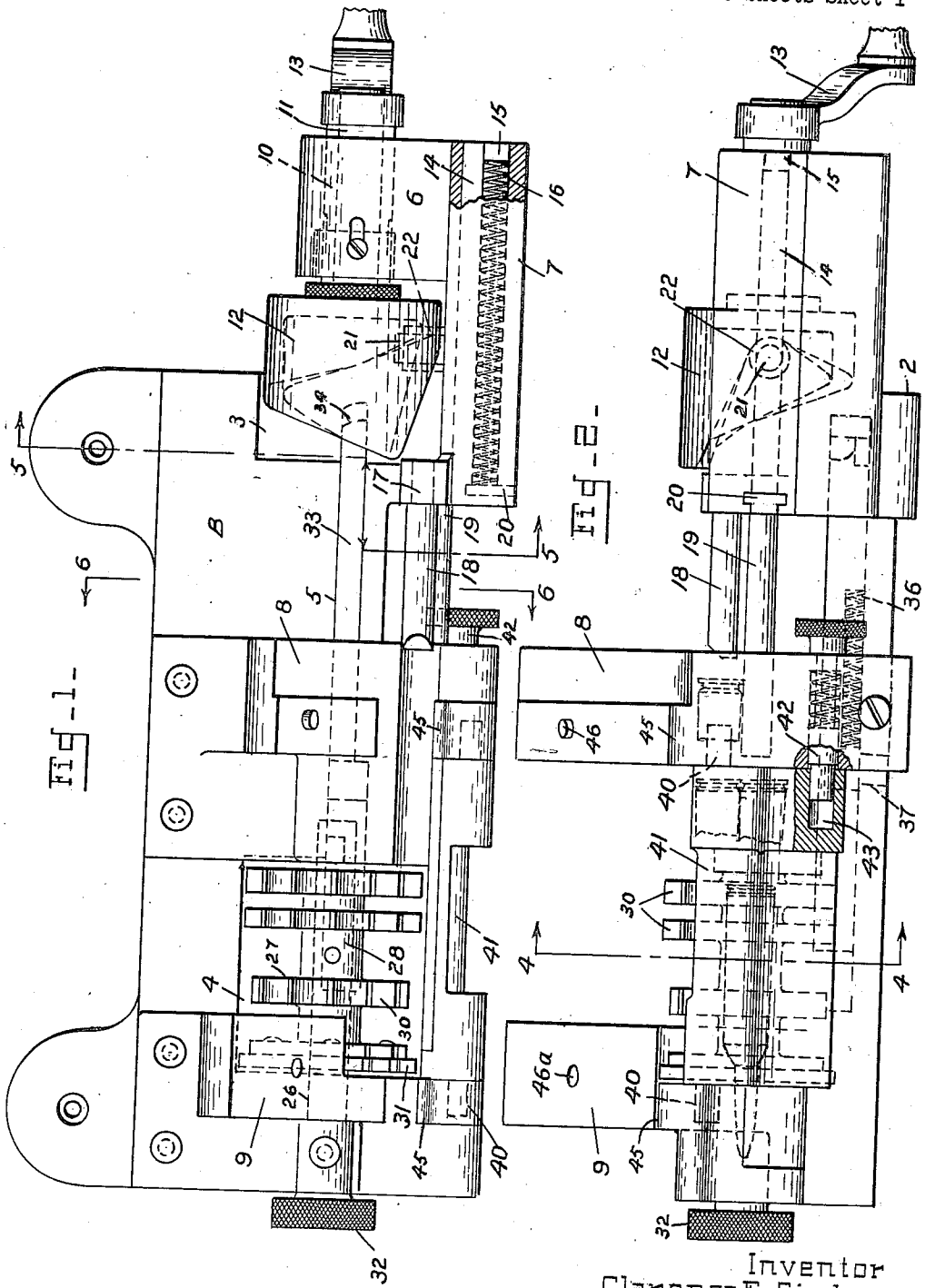


Fig-1-

Fig-2-

Inventor
Clarence E. Simpson
By W. N. Roach
Attorney

Sept. 28, 1937. C. E. SIMPSON 2,094,026

LINK LOADING MACHINE

Filed Aug. 31, 1934 3 Sheets-Sheet 2

Fig-3-

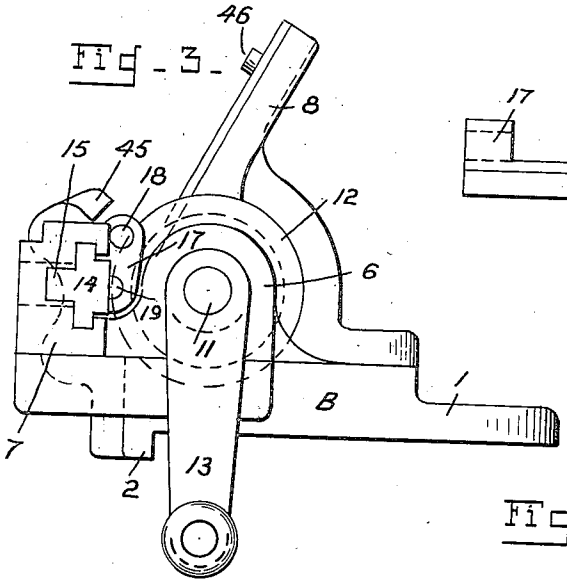


Fig-7-

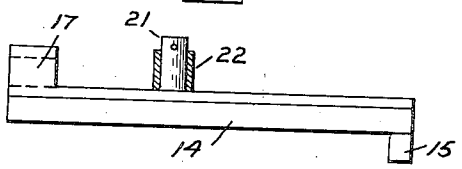


Fig-5-

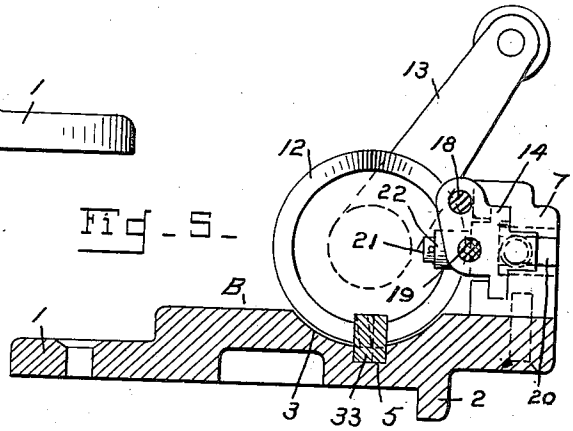


Fig-4-

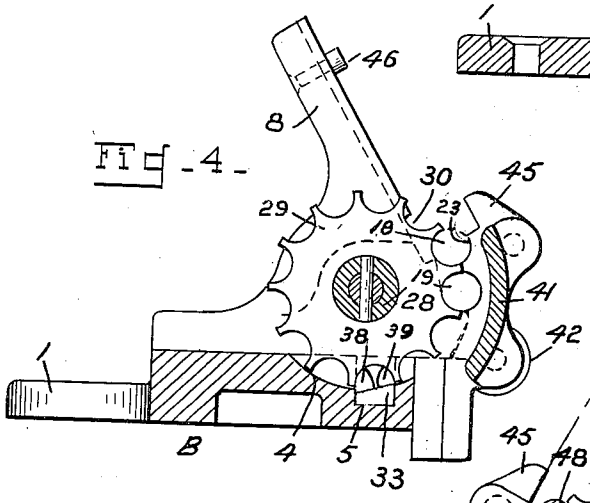


Fig-6-

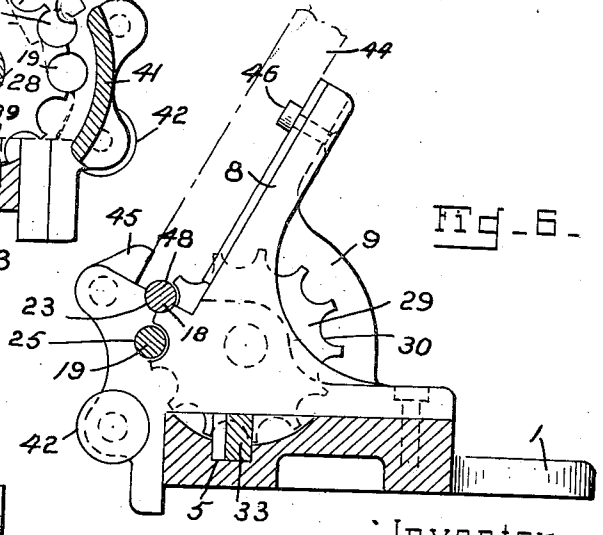
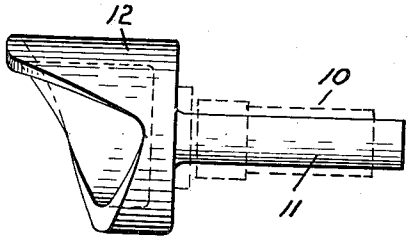


Fig-8-



Inventor
Clarence E. Simpson
By W. N. Roach
Attorney

Sept. 28, 1937. C. E. SIMPSON 2,094,026

LINK LOADING MACHINE

Filed Aug. 31, 1934 3 Sheets-Sheet 3

Fig-9-

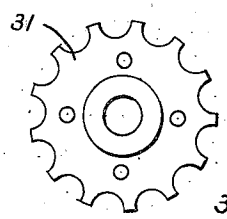


Fig-10-

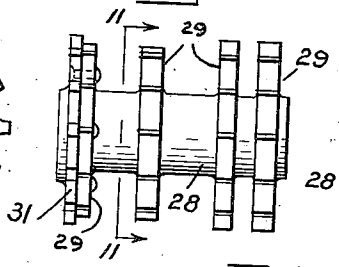


Fig-11-

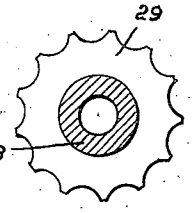


Fig-12-

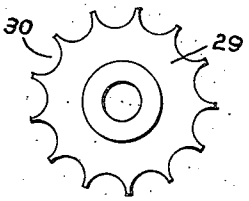


Fig-14-

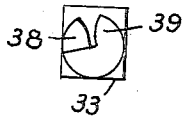


Fig-13

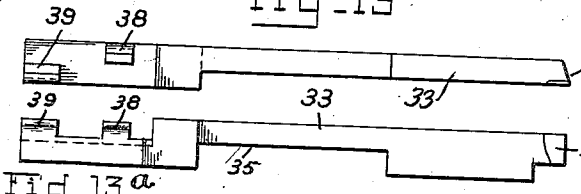


Fig-13a

Fig-15-

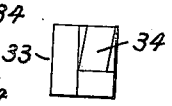


Fig-16

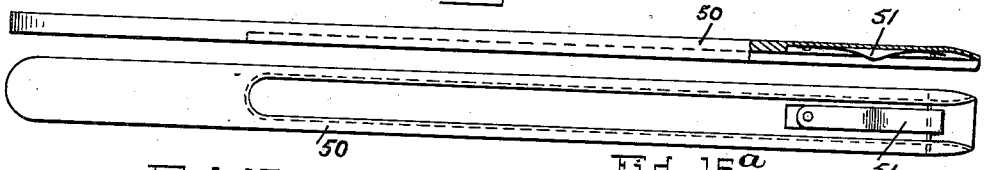


Fig-16a

Fig-17-

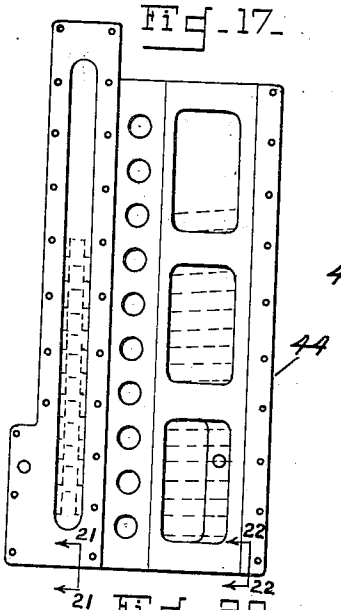


Fig-18-

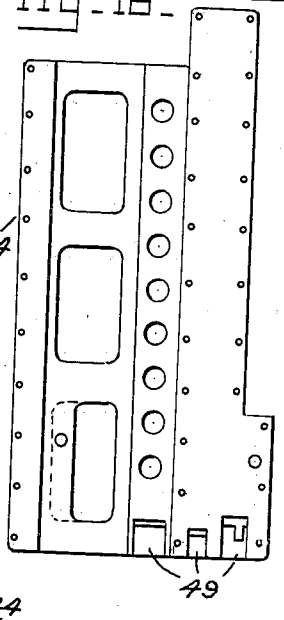


Fig-19

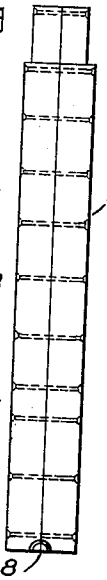


Fig-21-

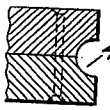


Fig-22-

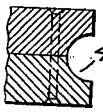
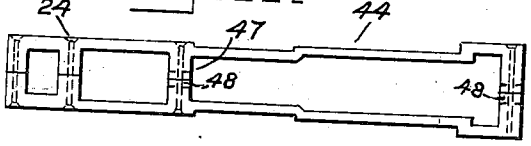


Fig-20-



Inventor

Clarence E. Simpson

By W. N. Roach

Attorney

UNITED STATES PATENT OFFICE

2,094,026

LINK LOADING MACHINE

Clarence E. Simpson, Springfield, Mass.

Application August 31, 1934, Serial No. 742,266

7 Claims. (Cl. 86—48)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

The subject of this invention is a belt loading machine intended primarily for loading link cartridge belts.

The main objects of the invention are the provision of a machine in which the feed wheel will operate automatically under the action of gravity; of simple and novel means for feeding cartridges to the machine; of novel means for intermittently stopping the movement of cartridges and links from the machine; and of simple means for actuating various parts of a cheap and efficient machine.

With the foregoing and other objects in view, the invention resides in the novel arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

A practical embodiment of the invention is illustrated in the accompanyings drawings, wherein:

Fig. 1 is a plan view of the device with the cartridge and link magazines removed.

Fig. 2 is a front elevation of the same.

Fig. 3 is a right end elevation.

Fig. 4 is a section on the line 4—4 of Fig. 2.

Fig. 5 is a section on the line 5—5 of Fig. 1.

Fig. 6 is a section on the line 6—6 of Fig. 1.

Fig. 7 is a plan partly in section of the plunger slide.

Fig. 8 is a side elevation of the cam.

Fig. 9 is a left end elevation of the feed wheel.

Fig. 10 is a side elevation of the feed wheel.

Fig. 11 is a section on the line 11—11 of Fig. 10.

Fig. 12 is a right end elevation of the feed wheel.

Fig. 13 is a plan view of the escapement bar.

Fig. 13a is a view in side elevation of the same.

Fig. 14 is a left end elevation slightly enlarged of the escapement bar.

Fig. 15 is a right end elevation slightly enlarged of the escapement bar.

Fig. 16 is a side elevation of the cartridge handling bar.

Fig. 16a is a plan view of the same.

Fig. 17 is a front elevation of the magazine.

Fig. 18 is a rear elevation.

Fig. 19 is a right side elevation.

Fig. 20 is a plan view.

Fig. 21 is a section on the line 21—21 of Fig. 17.

Fig. 22 is a section on the line 22—22 of Fig. 17.

Referring to the drawings by characters of reference:

There is provided a base B formed with lugs 1—1 apertured to receive screws or bolts by which the device may be fastened to a work table and with depending lugs 2—2 for locating the device with respect to the edge of such table. Troughs 3 and 4 are formed in the base to accommodate the operating cam 12 and the feed wheel 27 respectively, and a groove 5 extends between and partly into each trough to accommodate the escapement bar.

Fastened to the base, toward the right hand end thereof, in any well known and approved manner, preferably by machine screws, not shown, is a cam shaft housing 6 and a plunger slide housing 7. Also secured to the base at the front edge thereof and positioned substantially midway of its length is a right hand magazine bracket 8, and secured to the base near the left hand end thereof is a left hand magazine bracket 9.

Within the cam shaft housing 6 is mounted a bushing 10 to receive the shaft 11 of the cam 12. The end of the cam shaft projects beyond the housing and is adapted to receive a handle 13, by which the cam may be rotated. The cam is in the form of a hollow cylinder with the walls cut to provide the desired cam contour.

Within the plunger slide housing 7 is mounted for reciprocation a plunger slide 14 (see Figs. 1, 3, 5 and 7) of T shape in cross section to fit in a complemental T shape groove in the housing. At the right hand end of the slide is a laterally extending lug 15 forming an abutment for one end of the slide spring 16 while at the other end of the slide is a laterally off set head 17 apertured to receive an upper plunger 18 and a lower plunger 19 the ends of which may have a driving fit in the apertures. The other end of the slide spring 16 seats on a tongued plate 20 which closes an opening in the end of the housing provided to permit insertion of the spring. At a median position on the slide is a laterally projecting stud 21 upon which may be mounted a roller 22 to contact the cam surface of the cam 12 so that as the cam rotates the slide will be reciprocated due to the actions of the cam and spring.

The upper plunger 18 extends into a semi-cylindrical groove 23 formed in the right hand bracket 8 and in position to receive a cartridge from the cartridge magazine 24. This upper plunger is of sufficient length to advance the cartridge beyond the grooved portion of the bracket when the plungers are moved to the left by the

cam. The lower plunger 19 extends through an opening 25 in the right hand bracket 8 and is of a length sufficient to force a cartridge home in the links when the plunger is moved to the left by the slide.

Journaled in bearings in the brackets 8 and 9 is a feed wheel shaft 26 upon which the feed wheel 27 (Fig. 1) is secured. The feed wheel is preferably formed of a hub 28 provided with four spaced annular flanges 29 having spaced about their peripheries arcuate notches 30 for the reception of the cartridges and links. Secured to the left end flange 29, conveniently by rivets as shown, is a plate 31 which engages the ends of the links and takes the thrust when a cartridge is forced home in the links by action of the plunger. The protruding end of the shaft 26 may have mounted thereon a knurled knob 32 through means of which the feed wheels may be manually manipulated when necessary.

Within groove 5 of the base is mounted for reciprocation the escapement bar 33 which preferably has one end 34 angled off to cooperate more readily with the cam surface of the cam 12 and is formed on its under side with a cut in portion or slot 35 for the reception of a spring 36, one end of which rests against the right hand end wall of the slot and the other end of which abuts against a lug 37 secured to the base. From the foregoing it is evident that the spring tends to force the escapement bar to the right. The bar at its left end is semi-cylindrical and the upper portion provided with spaced offset lugs 38 and 39 the sides of which are curved to conform to the curvature of the walls of the peripheral notches 30 in the two rightmost members 29 and the spacing of the lugs is such that when one lug is in engagement with the notched flange with which it cooperates the other lug is just clear of the notched flange with which it cooperates. From the foregoing it will be evident that the feed wheel turns the distance of one notch on each complete cycle of the escapement bar.

At the front of the device and mounted on hinge pins 40—40 is a feed cover 41 normally held in closed position by means of a spring pressed plunger 42 mounted in the right hand bracket in position for its end to enter a recess 43 formed in the cover.

For the purpose of having a ready supply of links and cartridges to be fed to the machine, a magazine 44 is provided adapted to rest on the brackets 8 and 9 and to be held thereon by the hook arms 45—45 one extending forwardly from each bracket, and the magazine may be properly positioned on the brackets through means of stud 46 carried by the right hand bracket and adapted to enter an aperture in the rear plate of the magazine and a screw, not shown, passing through the aperture 46a in the left hand bracket and threading into the magazine. The magazine is preferably divided by a transverse wall 47 into two compartments, the right hand one for the reception of cartridges and the left hand one for the reception of links. The lower end face of the magazine is grooved as at 48 to permit the passage of the upper plunger and the cartridge being moved thereby, and suitable slots 49 are provided in the lower portion of the back plate to accommodate the feed wheel.

To facilitate loading cartridges into the magazine a grooved bar 50 is provided which slips over the heads of the cartridges and holds the cartridges by means of a light spring 51 secured to the bar in the bottom of the groove.

The operation of the device is as follows: With the magazine in position the machine is primed by placing a link and a cartridge in their respective compartments of the magazine, the tip of a cartridge or other convenient tool is placed against the right hand end of the escapement bar and the bar pushed to the left while at the same time turning the feed wheel through the knurled knob to the front and against the stop. The escapement bar is then released thus placing the cartridge in feeding position with respect to the link. Links are fed by gravity from the carton in which they are packed into the left hand compartment of the magazine; cartridges are then engaged by the bar 50 and lifted from the box in which they come packed and stripped from the bar into the right hand compartment of the magazine. Upon turning the handle the cam will force the plunger slide to the left causing the upper plunger to move the lowermost cartridge from the groove 23 into notches on the feed wheel; further rotation of the cam will cause the escapement bar to be forced to the left allowing the feed wheel which is unbalanced by pressure of the operator's finger on the uppermost link to be displaced the distance of one-half a notch, the spring will then return the escapement bar to its normal position allowing the feed wheel to move the distance of another half notch. Upon again completing this cycle of operation the lower plunger will act on the cartridge which is now carried by the feed wheel to force the same into the links.

Further operation will continue to force cartridges into the links and the weight of the loaded links, after about twenty links have been loaded acts to cause rotation of the feed wheel. The loaded belt escapes from the device at the opening between the feed wheel and the lower edge of the feed wheel cover.

I claim:

1. A link loading machine embodying a base, spaced brackets mounted on the base for the reception of a magazine, a feed wheel journaled in the brackets and arranged to be operated by the action of gravity, a pair of plungers one for positioning a cartridge and the other for inserting a cartridge into links, an escapement for the feed wheel, and means for operating the plungers and the escapement.

2. A link loading machine embodying a base, spaced brackets mounted on the base for the reception of a magazine, a feed wheel journaled in the brackets and arranged to be operated by the action of gravity, a pair of plungers one for positioning a cartridge and the other for inserting a positioned cartridge into links, an escapement for the feed wheel, and a cam for operating the plungers and the escapement.

3. A link loading machine embodying a base, spaced brackets mounted on the base for the reception of a magazine, a feed wheel journaled in the brackets and arranged to be operated by the action of gravity, a slide, a pair of plungers carried by the slide one for positioning a cartridge and the other for inserting a positioned cartridge into links, an escapement for the feed wheel, and a cam for operating the slide and the escapement.

4. In a link loading machine, a feed wheel arranged to be operated by the action of gravity and having a link-carrying portion and a cartridge-carrying portion, means for supplying links to the link-carrying portion of the feed wheel, means for supplying cartridges to the cartridge-

carrying portion of the feed wheel, a cartridge-moving mechanism having one member for moving a cartridge onto the cartridge-carrying portion of the feed wheel during one cycle of the mechanism whereby the feed wheel may displace the cartridge and having another member for moving the displaced cartridge into the link during the succeeding cycle, and means for controlling movement of the gravity-actuated feed wheel.

5. In a link loading machine, a feed wheel arranged to be operated by the action of gravity and having a link-carrying portion and a cartridge-carrying portion, means for supplying links and cartridges separately to the link and cartridge-carrying portions of the feed wheel, means for controlling rotation of the feed wheel whereby a link and cartridge in the feed wheel are displaced, and means for moving the displaced cartridge carried by the feed wheel into the link.

6. In a link loading machine, a feed wheel arranged to be operated by the action of gravity, means for supplying links and cartridges to the feed wheel, an escapement for controlling step by step rotation of the feed wheel, means for moving a cartridge carried by the feed wheel into a link, and a cam rotatable in a plane perpendicular to the escapement and cartridge moving means and engageable therewith to move these elements.

7. In a link loading machine, a feed wheel comprising a plurality of notched flanges and arranged to be operated by the action of gravity, an escapement bar mounted for reciprocation parallel to the axis of the feed wheel and a pair of longitudinally and circumferentially spaced lugs on said bar arranged to successively engage notched flanges of the feed wheel to control step by step rotation of the feed wheel.

CLARENCE E. SIMPSON.