

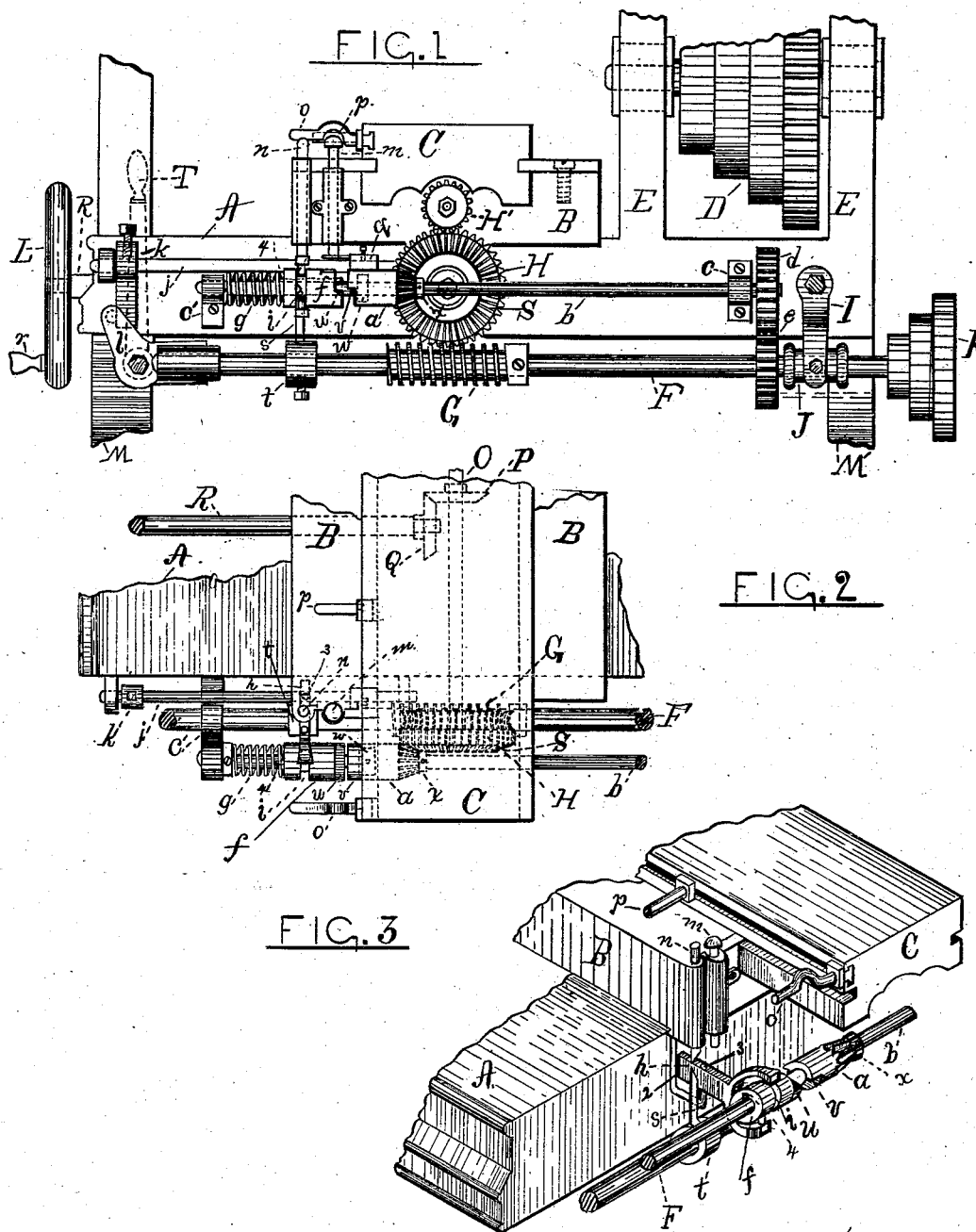
(No Model.)

E. F. LATHAM.

FEED DEVICE FOR MILLING MACHINES.

No. 260,760.

Patented July 11, 1882.



Witnesses.

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UNITED STATES PATENT OFFICE.

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FEED DEVICE FOR MILLING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 260,760, dated July 11, 1882.

Application filed July 5, 1881. (No model.)

To all whom it may concern:

Be it known that I, EDWARD F. LATHAM, of Bridgeport, county of Fairfield, and State of Connecticut, have invented a certain new and useful Accelerated Reverse Feed for Milling-Machines; and I do hereby declare the following to be a full, clear, and exact description of my invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is to provide on milling-machines an automatic reverse or quick-return movement.

My invention consists in providing a pinion operated and controlled by the proper mechanism, hereinafter described, to combine and engage with the feed-driving gear, whereby the carriage, after traveling far enough in one direction to perform the work required, will have its motion automatically reversed and will return to its former position.

By the present method of operating milling-machines, after the cut has been taken on the work the carriage has to be brought back by hand, and, run as they are in most cases in gangs, the time employed in operating them is considerable. With my improved method the carriage automatically returns to its original position, ready at hand for the operator to readjust his work.

To more clearly understand my invention reference is had to the drawings accompanying this specification, in which—

Figure 1 is a rear elevation of an ordinary milling-machine. A is the bed of the machine. B is the saddle, in which works the carriage C. D is a portion of the driving cone and gear. E E are the standards to support the same. F is the worm-shaft; G, the worm; H, the feed-driving gear. H' is the feed-gear which operates the carriage C. a is the pinion on the shaft b, which engages with the gear H, reversing the motion of the carriage C. c c are hangers, attached to the bed A, to support and provide bearings for the shaft b. d is a gear on the shaft b, which engages with the gear e of the worm-shaft F, imparting motion to the shaft b. I is a hanger having box J to support the worm-shaft F. K is a cone-pulley, which drives the worm-shaft F. f is a clutch-sleeve on the shaft b, to engage with the pin-

ion a. g is a spiral spring to operate the sleeve f and force it in contact with the pinion a. h is a fork-lever operating in the groove i of the clutch-sleeve f, to disengage it from the pinion a. j is a short shaft to which the trip-lever k is attached, which engages with the toe-piece l of the worm-shaft, holding it up and keeping the worm G in contact with the worm-gear. m is the forward and n the reverse stop-pin, operated by the toes o and p attached to the carriage C. q is a trip on the shaft j, engaging with the stop-pin m, which throws the trip-lever k out of contact with the toe-piece l, and allows the worm-shaft F to drop. L is the wheel, having handle r, by which the carriage C is operated, when necessary, by hand. M M are legs of the machine. s is a finger attached to the collar t of the worm-shaft F, which disengages the stop-pin n from contact with the fork-lever h.

Fig. 2 is a partial plan view, showing a section of the carriage C, saddle B, and bed A. N, Fig. 2, shows the worm-wheel, which, together with the feed-driving gear H, is attached to the shaft O. On the shaft O is the bevel-gear P, which engages with the bevel-gear Q of the shaft R, having the wheel L attached. On the face of the feed-driving gear H is formed the face-gear S, engaging with the pinion a.

Fig. 3 is a perspective view of a part of the bed A, saddle B, and carriage C, and is intended to show more clearly the construction of the fork-lever h and mode of operating it. 2 is a bracket attached to the saddle B, projecting downward and having an upward-projecting pintle, 3, on which the fork-lever h freely swings laterally. It is not essential that the bracket 2 should be constructed exactly as shown. Any suitable means by which the fork-lever h will swing freely will answer. It is necessary that the bracket 2 should always be attached to the saddle B so as to stand in the same relative position with the stop-pins m and n.

Its construction and operation are as follows:

Fig. 1 represents the machine in gear to feed the carriage forward. When it has traveled the required distance the toe p will come in contact with the stop-pin m and depress it, releasing the toe-piece l from contact with the

trip-lever *k*, allowing the shaft *F* to drop sufficiently to throw the worm out of gear and stop the carriage *C*, arresting its forward movement. When the worm-shaft *F* drops it disengages the finger *s* from contact with the fork-lever *h*, allowing the spring *g* to act, carrying the sleeve *f* having clutch *u* forward in contact with clutch *v* of the pinion *a*, reversing the movement of the carriage *C*. The sleeve *f* has a free lateral movement on the shaft *b*, and rotates with it, the key 4 preventing it from rotating independent of the shaft. When the worm-shaft drops and throws the worm *G* out of gear, the gears *d* and *e* still remain in contact. The drop of the shaft *F* is so slight at the end of the shaft occupied by the gears *d* and *e* that there is but little change in their relation with one another. The shafts *F* and *b* are continually in motion, the pinion *a*, loosely fitting the shaft *b*, and, prevented from end play by the collars *w* and *x*, acts upon the gear *H* only when in contact with the sleeve-clutch *f* when feeding the carriage *C* backward. Any suitable form of pinion or worm may be used on the shaft *b* that will engage with and transmit motion to the feed-driving gear *H*. When the carriage *C* in its reverse movement has traveled far enough, the toe *o* will come in contact with the stop-pin *n*, depressing the pin *n*, whose lower end is beveled to facilitate its contact with the fork-lever *h*, and force the fork-lever *h* around and the sleeve-clutch *f* out of contact with the pinion *a*. The carriage *C* will then remain stationary at its starting-point, ready for the operator to adjust the work. When necessary again to feed forward, the worm-shaft *F* is raised by means of the handle *T*, which connects with the toe-piece *l*, bringing it in contact with the trip-lever *k*. A pin is provided on the inner face of the toe-piece *l*, which engages with the trip-lever *k*, and operates to hold it up, also holding the worm-shaft *F* firmly in position, and bringing the worm *G* in gear. The stop-pin *m*, resting on the trip *q* of the shaft *j*, is raised at the same time. When the worm-shaft *F* is raised the finger *s* (see Fig. 3) forces the stop-pin *n* upward, disengaging

it from the fork-lever *h*, so as to enable the spring *g*, Fig. 1, to carry the clutch-sleeve *f* forward to connect with the pinion *a* as soon as the worm-shaft *G* drops. The stop-pin *n* may be fitted sufficiently close in its bearing in the carriage *C* to prevent its dropping down except when acted upon by the toe *o*; or a suitable friction-spring may be used for that purpose.

The carriage *C*, saddle *B*, bed *A*, the worm-shaft *F*, and its construction, and the means by which it is operated, are not new, and therefore I do not claim them as such.

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

1. In a milling-machine, the combination, with the worm shaft *F*, having gear *e*, of the shaft *b*, having gear *d*, and pinion *a*, with the feed-driving gear *H*, whereby the carriage *C* is fed in a reverse direction, substantially as set forth.

2. The combination, with the carriage *C* and feed-gear *H'*, of feed-driving gear *H*, the shaft *b*, having clutch-pinion *a*, clutch-sleeve *f*, fork-lever *h*, spring *g* to carry the sleeve in contact with the pinion *a*, bearings *c c'* for the shaft *b*, as set forth.

3. The combination, with the fork-lever *h*, having bracket 2, of the finger *s*, attached to the worm-shaft *F* and operated by it to hold the clutch-sleeve *f* free and in readiness to be carried by the spring *g* in contact with the pinion *a* when the worm-shaft *F* drops, substantially as described.

4. The combination of the carriage *C*, having the toe *o*, with the stop-pin *n* and fork-lever *h*, substantially as described, and for the purpose set forth.

In testimony that I claim the foregoing I have set my hand in the presence of two witnesses.

EDWARD F. LATHAM.

Witnesses:

RUDOLPH KOST,
GERHARD T. WESTÜNG.